

Cottonwood Sand Mine Water Quality Evaluation Report Jamacha, California

Submitted to

Helix Environmental Planning
7578 El Cajon Boulevard
La Mesa, California 91942

Prepared by

Geo-Logic
ASSOCIATES

3150 Bristol Street Suite 210
Costa Mesa, California 92626

November 2020
Revised July 2022

Certification

This technical report was prepared in accordance with generally accepted professional hydrogeologic principles and practices. This technical report makes no other warranties, either expressed or implied as to the professional advice or data included in it. It has not been prepared for use by parties or projects other than those named or described herein. It may not contain sufficient information for other parties or purposes.

GEO-LOGIC ASSOCIATES

JOHN J. DODGE

John J. Dodge, PG (CA), CHG (CA)
Principal Hydrogeologist
jdodge@geo-logic.com
3150 Bristol Street, Suite 210
Costa Mesa, California, 92626

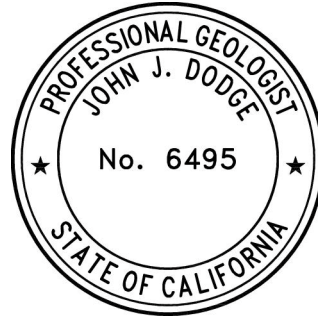
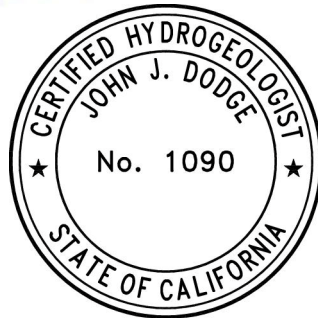


Table of Contents

Executive Summary	1
1. Introduction	3
1.1 Purpose of the Report	3
1.2 Project Location and Description	3
1.3 Existing Site Conditions	5
2. Sampling and Analysis Procedures	6
2.1 Drilling and Soil Sampling Procedures	6
2.1.1 Soil Sampling Procedures	6
2.2 Water Quality Sampling Procedures	7
2.2.1 Surface Water	8
2.2.2 Groundwater	8
2.2.3 Sampling and Sample Handling	9
3. Water Quality Investigation Results	9
3.1 Soil Sample Results	9
3.2 Surface Water Sample Results	10
3.3 Groundwater Sample Results	12
3.4 Summary	13
4. Summary of Project Impacts and Mitigations	13
References	14

List of Figures

- 1 Site Location Map
- 2 Site Plan

List of Tables

- 1 Analytical Methods
- 2 Soil Sample Comparison Data
- 3 Water Quality Comparison - Surface Water
- 4 Water Quality Comparison - Groundwater

List of Appendices

- A Soil Boring Logs
- B Field Notes and Laboratory Analytical Reports

Acronyms and Abbreviations

Afy	Acre-feet of water per year
Amsl	Above Mean Sea Level
ARAR	Applicable or Relevant and Appropriate Requirements
BMP	Best Management Practice
bgs	Below Ground Surface
CEQA	California Environmental Quality Act
COC	Chain-of-Custody
DEH	Department of Environmental Health
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GLA	Geo-Logic Associates
HASP	Health and Safety Plan
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg/Kg	Milligram per Kilogram
mg/L	Milligram per Liter
MPN	Most Probable Number
mS/cm	Milli Siemens Per Centimeter
MUP	Major Use Permit
N	Nitrogen
NTU	Nephelometric Turbidity Unit
ORP	Oxidation-Reduction Potential
PCB	Polychlorinated Biphenyl
PDS	County Department of Planning and Development Services
SMCL	California Secondary Maximum Contaminant Level
SVOC	Semi-Volatile Organic Compound
SWA	Sweetwater Authority
SWPPP	Storm Water Pollution Prevention Plan
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TPY	Tons per Year
TTLC	Total Threshold Limit Concentration
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WQO	Water Quality Objective

Executive Summary

The Cottonwood Sand Mine is to be located on the current Cottonwood Golf Club property (replacing the two 18-hole golf courses) in Jamacha Valley at 3121 Willow Glen Drive near the communities of Rancho San Diego and Jamacha, in southern San Diego County, California. The site is situated within the Sweetwater River watershed, downstream of the Loveland Reservoir, and upstream of the Sweetwater Reservoir (Figure 1). The project proposes to mine areas of the Property over a period of 10 years, reclaiming the excavated areas with wash fines and stockpiled topsoil, and revegetating the site with native plant species and erosion control seed mix following the conclusion of mining operations. The project proposes to use on-site groundwater from up to eight existing groundwater supply wells as a source of supply to meet the operational and landscape irrigation requirements of the project. At the conclusion of the project, when the plant community is established within the reclaimed area, no groundwater will be used on the project site.

The purpose of this report is to evaluate the existing water quality conditions of the Project site associated with the current golf courses. Samples of the surface water, groundwater and soil were collected at top, middle and bottom site locations and tested for a range of analytes to assess the current water quality and soil conditions related to the golf course operations. Results of the soil, surface water, and groundwater sampling indicate water quality at the Project site generally meet water quality objectives and Federal and State Maximum Contaminant Levels (MCLs), with the exception of exceedances of some State secondary MCLs, which relate to aesthetics of the water quality. Based on these results, generally the water quality related to dissolved content (as monitored by specific conductance and TDS concentrations) and iron and manganese is relatively poor, most likely associated with naturally occurring metals from the surrounding bedrock, while all other constituents appear to meet drinking water standards. With the exception of some very low estimated trace level pesticides in the uppermost soil samples, not measured in water quality samples, there is little evidence of anthropogenic impacts from the Project site.

Mining operations and initial reclamation activities have the potential to create temporary impacts to water quality. Ground disturbance may release particulates into the receiving water and into stormwater. However, compliance with current federal, State and local Clean Water regulations, including the Industrial General Permit, which requires implementation of an approved Stormwater Pollution Prevention Plan (SWPPP), will reduce impacts to the water quality.

The project proposes to work in phases, limiting the area of ground disturbance, and not mining within the existing Sweetwater River channel. Once an area has been mined, it will be planted and irrigated to establish a native plant community. The established reclamation areas will capture runoff, allowing the water to infiltrate back into the ground, decreasing the discharge from the project site and improving water quality. At the completion of the project the site will be reclaimed and revegetated to a riparian corridor with adjacent upland plant community with trails for public use. Potential impacts to the water quality after completion will be less than significant.

1. Introduction

1.1 Purpose of the Report

Geo-Logic Associates (GLA) has prepared this water quality investigation report for the Cottonwood Sand Mine Project (Project) Environmental Impact Report (EIR) as part of the requirements for obtaining a Major Use Permit (MUP) for the extraction of aggregate on the existing Cottonwood Golf Club property. The purpose of this report is to document the existing water quality conditions of the Project site and to evaluate potential impacts to groundwater and surface water quality as a result of the sand mining operations. Additionally, this report presents recommended measures to avoid, minimize, and/or mitigate significant impacts consistent with federal, state, and local rules and regulations including California Environmental Quality Act (CEQA), and San Diego County Groundwater Ordinance, as applicable.

As part of the MUP process, the Sweetwater Authority (SWA) and the local Valle de Oro Planning Group reviewed the initial Project Description (EnviroMine, 2018). The SWA issued comment letters dated December 13, 2018, and November 21, 2019, and the Valle De Oro Community Planning Group issued comments dated November 22, 2019. Both of these groups expressed concerns regarding potential impacts to water quality by the proposed Project. The SWA's primary concern is that the mining operation may impact water quality in the Sweetwater River, which passes through the Project site before it flows three miles downstream to the Sweetwater Reservoir - a drinking water source for about 200,000 people in San Diego County.

GLA prepared a Water Quality Evaluation Work Plan (GLA, 2020), to collect samples of soil, surface water, and groundwater for testing to address the agency and planning group concerns. The subsequent sampling program was completed generally in accordance with the additional comments received from the County Department of Planning and Development Services (PDS), and the SWA as much as feasible, noting that comments from the SWA were not received prior to the start of the soil sampling portion of the program. This report presents the test results of select surface water, groundwater, and soil samples collected from within the Project area and assesses the existing water quality associated with the current golf course with comparisons to State and local, basin-specific water quality objectives (WQOs).

1.2 Project Location and Description

The Cottonwood Sand Mine Project is to be located on the current Cottonwood Golf Club property, replacing the two 18-hole golf courses (referred to as the Lakes and Ivanhoe courses). Specifically, the Project is located in Jamacha Valley at 3121 Willow Glen Drive near the

communities of Rancho San Diego and Jamacha, in southern San Diego County, California (Figure 1). The approximately 280-acre site is situated within the Sweetwater River valley and in the floodplain of the Sweetwater River, which flows in a northeast-to-southwest direction through the site. Elevations on the project site range from approximately 320 feet above mean sea level (amsl) to 380 feet amsl. The area to the south consists of rugged terrain rising quickly to elevations over 800 feet amsl, and continuing to rise to San Miguel Mountain, at over 2,500 feet amsl, approximately three miles to the south. Land uses in the project vicinity include residential and rural residential development to the north and south, extractive operations to the east, and an adjacent golf course to the southeast. Open space is present in the hills south, east, and west of the site. A National Wildlife Refuge abuts the western end of the property along the river. Some areas of the Property will not be mined, but may be disturbed as part of the reclamation effort for the property.

The project's mining operations would extract, process, and transport sand using conventional earth moving and processing equipment. Approximately 4.3 million cy (6.40 million tons) of material are proposed to be extracted. Mining and extraction activities are expected to produce approximately 3.8 million cy (5.7 million tons) of sand and gravel for market use, with a 10 percent waste factor from the total amount extracted that includes wash fines and materials undesirable for processing. Material extracted and processed at the site would be suitable for construction uses and would be available to customers in San Diego County. Approximately 214 acres of the approximately 280-acre Project site are proposed for extractive use under a phased extraction program. Surface areas not disturbed by mining would be subject to removal of invasive species in the river channel on the southwest portion of the site or be left in their current condition. The existing Sweetwater River channel and the majority of native habitat that currently exists on the site would be retained.

Working from southwest to northeast, the project would be mined in three continuous phases, with sub-phases in each major phase. In addition, a fourth phase of reclamation would follow the mining phases on the processing plant site. The Project will be fully completed with vegetation established in 12 years. Native habitat will be planted within the channel and slopes. Vegetation monitoring will continue for a minimum of two years and until performance standards are met. There will be no human intervention; including, irrigation, fertilization, or weeding after project completion.

Although the Otay Water District provides potable water to the area, the Project proposes to use on-site groundwater from up to eight existing groundwater supply wells to meet the operational and landscape irrigation requirements of the Project. No new groundwater wells will be constructed and no borings will be converted to groundwater monitoring wells. Based on the

information contained in the project description, Project components that will require water include dust suppression, aggregate processing/surface watering of outgoing loads, and native plant irrigation. At a process rate of 570,000 TPY, an estimated 84.3 acre-feet of water would be used per year (afy), including evaporative loss. Landscape irrigation is estimated to require an average of 55.6 afy, resulting in an average total groundwater demand of 139.9 afy over the Project duration. By comparison, an estimated 804 afy of groundwater was applied to the existing Cottonwood Golf Club property for irrigation (EnviroMine, 2020). At the conclusion of the project, when the plant community is established within the reclaimed area (two years after mining operations are complete), no groundwater will be used on the project site. The property will become open space along the Sweetwater channel, with remaining land suitable for land uses allowed by the existing zoning classifications.

1.3 Existing Site Conditions

The Project is located along the Sweetwater River within the Jamacha Hydrologic Subarea of the Middle Sweetwater Hydrologic Area, which is within the Sweetwater Hydrologic Unit. It is situated within the Peninsular Range Province of California, which comprises granitic rocks of the Cretaceous Southern California Batholith. The granitic rocks in the vicinity of the site are predominantly gabbro, monzogranite, tonalite and granitoid rocks that are exposed on the hillslopes. Generally, the granitic bedrock is most weathered near ground surface becoming less weathered with depth. In the floodplain of the Sweetwater River within the Project site, based on limited available boring/well logs, these granitic rocks underly a relatively thin veneer (about 30 to 60 feet thick) of Quaternary alluvium in the floodplain of the Sweetwater River. The alluvium is predominantly composed of unconsolidated fine- to coarse-grained sand with varying amounts of silt/clay and rounded granitic and metavolcanic gravel and cobbles.

Two wells on the golf course property have been monitored by the SWA between January 2007 and February 2019. They include Ivanhoe #11 on the northeast, upgradient end of the site and Lakes #11 on the southwest downgradient end of the site. These two wells located on either end of the property will remain available for monitoring by the SWA during and after the project. The average groundwater elevation at up-gradient Ivanhoe #11, is about 339 ft-above mean seal level (msl), while that at downgradient Lakes #11 is about 315 ft-msl. Groundwater levels, on average, are deeper below ground surface (bgs) at Ivanhoe #11 (about 26 ft bgs) than down-gradient at Lakes #11 (about 12 ft bgs).

Based on San Diego County Department of Environmental Health (DEH) records, there are 114 permitted groundwater wells within approximately one mile of the site. Most of the wells are in two areas within large-lot, residential parcels on the southern side of the Project site. Since this

area is covered by the Otay Water District, which is responsible for providing potable water to these residences, the wells in these two areas (Steele Canyon Estates and properties near Par 4 Drive) are believed to provide additional landscape irrigation water for these properties.

2. Sampling and Analysis Procedures

Sampling and analyses were performed in general accordance with the sampling and analytical procedures described in the Site Water Quality Evaluation Work Plan (GLA, 2020). A project Health & Safety Plan (HASP) was also prepared for the work. The HASP identifies minimum procedures to be taken to protect workers during the field activities. A completed chain of custody (COC) form, detailing the sample I.D. numbers, date and time collected, analyses requested, and other project information accompanied each sample to the laboratory. The COC forms were signed and dated by all personnel retaining custody of the samples. Field notes and analytical reports are included in Appendix B.

2.1 Drilling and Soil Sampling Procedures

Soil borings and associated soil sampling at the Project site was completed by GLA on March 6 and 20, 2020. GLA selected ABC Liovin a California State C-57 licensed drilling contractor to perform the drilling and soil sampling using a hollow stem auger drilling rig. A summary of the protocols used for drilling, sample collection and analysis are presented below.

2.1.1 Soil Sampling Procedures

Before field work was initiated, drilling permits were obtained from San Diego County DEH. In addition, GLA coordinated with Underground Service Alert prior to the drilling program to verify that there were no underground utilities near the planned drilling locations.

All drilling and sampling equipment was decontaminated before being transported to the Project and between boring locations. Decontamination was achieved by using hot water, high-pressure sprayers and/or by scrubbing with clean water and mild soap followed by rinsing with clean water. Water used for decontamination was collected from a potable water source and transported to the Project. Since significant chemicals were not anticipated to be encountered during drilling activities at the Project site, spent wash and rinse waters were broadcast to the ground, avoiding discharge to the Sweetwater River drainage. Drill cuttings generated at the boring locations were spread out at the drilling location.

As shown on Figure 2, a total of three borings, one in each of the proposed extraction phases, were advanced on the golf course property. The boring locations included a boring near the western and eastern boundaries of the golf course (PH-1 and PH-3, respectively), and one within the middle section (PH-2); near the Steele Canyon bridge. Because the mining operations plan may excavate to a depth of up to 40 feet, each boring was advanced to a maximum of 40 feet; one in each of the three Project Phase areas. Each boring was drilled using 8-inch hollow stem auger, and was sampled using conventional 2.5-inch California modified split-spoon sampler at depth to obtain relatively undisturbed samples of fill and native materials encountered in the boreholes. Soil sample lithology was logged and described per ASTM D 2488. The boring logs are included in Appendix A.

From 6-inches to 1.5 feet bulk grab samples were collected using a hand auger. Beginning at five feet, 2.5-inch drive samples were collected every five feet to the bottom of the boring and at the soil-water interface. The samples were contained within 6-inch long, decontaminated stainless steel tubes and Teflon caps were placed on the tubes. Three samples from each boring were collected and submitted to BC Laboratories (BC Labs) in Bakersfield, CA under COC to evaluate the chemistry of the soils. Samples analyzed from each boring included two shallow samples at 0.5 ft bgs and 1.5 ft bgs and a third sample that was deeper than five feet (selected based on geological sample analysis). The three selected samples from the first two borings (PH-1 and PH-3) were tested by BC Labs for analytes listed at the top of Table 1. Following a request for an expanded list of analytical testing by SWA, soil samples from PH-2, which was drilled at a later date, were tested for additional analytes (Table 1). Of note, work plan comments from SWA regarding the expanded list of analytes were received after drilling, sampling, and analysis of soils from borings PH-1 and PH-3. Table 2 presents a summary of the analytical results.

2.2 Water Quality Sampling Procedures

Because there is typically no flow within the Sweetwater River unless the SWA releases water from the Loveland Reservoir, or during a prolonged period of heavy rain. Surface water samples were obtained during heavy rain events on April 10 and 14, 2020. The project was put on hiatus with the onset of isolation protocols instituted by the COVID pandemic and it was not re-started until the end of September. Therefore, groundwater sampling was not completed until October 1, 2020. The following sections present the methods used to collect surface water and groundwater samples at the Cottonwood Golf Club.

2.2.1 Surface Water

Review of available records indicated few recent groundwater or surface water samples have been collected within the Project area. A study by NBS Lowry (1990) evaluated groundwater and surface water quality within the Middle Sweetwater River area between 1979 and 1990, finding slightly elevated total dissolved solids (TDS) downstream. Nitrate concentrations reported were generally within acceptable limits in the Sweetwater river valley. Recognizing that these results are 30 years old, to support the proposed Project additional data was collected to evaluate the existing water quality at the Project site.

To obtain representative surface water samples, GLA collected upstream (background), mid-site, and downstream samples from the Sweetwater River channel during a week of heavy rain which generated sufficient flow within the Sweetwater drainage¹ⁱ. The sample locations are presented in Figure 2. Samples were collected at the upstream and mid-site locations on April 10, 2020, though, staff vehicle issues prevented collection of the downstream sample. Therefore, a second sampling event was conducted on April 14, 2020 to obtain a representative downstream sample. Initially, grab samples were collected at each sample location to test field water quality parameters. Surface water samples for laboratory analyses were collected by submerging laboratory-supplied sample containers or a decontaminated sampling dipper into the surface water channel at the designated sampling locations. Surface water samples were submitted for analyses of the parameters listed on Table 1 and a summary of the analytical results are presented in Table 3.

2.2.2 Groundwater

Three groundwater production wells - Lakes #11, Ivanhoe #8 and Ivanhoe #11 (Figure 2) were sampled on October 1, 2020. The Ivanhoe #11 well is located on the eastern property boundary and represents the most upgradient groundwater monitoring point, while the Lakes #11, located on the western property boundary represents the downgradient groundwater monitoring point. Because both of the Ivanhoe course wells are active (equipped with electrical submersible pumps and level switches), grab samples were collected at a sampling valve on piping from the well head after a minimum of 10 gallons were pumped from each well and field water quality parameters had stabilized. However, the Lakes #11 well does not contain a dedicated pump and therefore an electrical submersible pump was placed in the well to remove a minimum of three

¹ Surface water flow on the property only occurs during major storm events and when water is released by the SWA from Loveland Reservoir to the Sweetwater Reservoir. As a result, collection of surface water samples is limited to these events. The sampling event occurred during the only major storm event that occurred during the investigation period.

casing volumes from the well. The purge water was routed through a sampling chamber equipped with probes to measure dissolved oxygen, specific conductance, pH, oxidation-reduction potential, and temperature. When three consecutive readings of these field parameters had stabilized, the water quality was determined to be stable and samples were collected. Turbidity was also measured and recorded, but is not included as a stabilization criterion.

2.2.3 Sampling and Sample Handling

Liquid samples were collected in approved sample containers provided by the analytical laboratory, and filled based on decreasing volatility, beginning with containers used for VOCs, then other organic analyses, followed by general chemistry constituents, and so forth. Each sample container was filled completely and immediately capped, labelled, and placed in a cooler. Samples for VOC analysis were filled by pouring the sample down the sides of the container to minimize aeration and capped with no headspace. The samples were packaged in an ice-filled cooler for transport and shipped to BC Labs (or delivered to EnviroMatrix Analytical, Inc for surface water samples with short hold times). Completed COC forms, detailing the sample I.D. numbers, date and time collected, analyses requested, and other project information, accompanied the samples to the laboratories. The samples were analyzed for the analytical parameters listed in Table 1 and a summary of the analytical results is presented in Table 4.

3. Water Quality Investigation Results

The water quality investigation entailed sampling soil, surface water (from the Sweetwater River), and groundwater from one location within each of the three Project phase areas (Figure 2). Full analytical reports are provided in Appendices C and the results are summarized in Tables 2 through 4.

3.1 Soil Sample Results

Unconsolidated sand and clay were encountered to depths in the range of 30 to 40 ft bgs during drilling and sampling. Refusal was encountered at 30 ft bgs at the Phase 1 boring (PH-1) after encountering large gravels consisting of metavolcanics and tonalite. These gravels were also encountered at the bottom (40 ft bgs) of the Phase 2 boring (PH-2). Boring logs are provided in Appendix A.

The analytical results for the soil samples collected from the Phase 1, Phase 2 and Phase 3 borings (PH-1, PH-2, and PH-3) are presented in Table 2, along with any applicable total

threshold limit concentrations (TTLCs) for comparison with hazardous waste characterization standards. Statistics including median, average, standard deviation, minimum and maximum are also presented for each constituent. Laboratory analytical reports are provided in Appendix B.

As indicated in Table 1, soil samples from each boring were tested for chlorinated herbicides, organochlorine pesticides, VOCs, and TOC. As summarized in Table 2, very low and estimated trace concentrations of one or more organochlorine pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT) were measured in samples from PH-1 and PH-3. Organochlorine pesticides were only detected in near-surface samples (0.5-foot and 1.5-foot sample depths) and no organochlorine pesticides were detected in samples from PH-2. Generally, TOC concentrations decreased with sample depth, as expected with typical soil development. Lead results were similar in all samples.

Samples from the PH-2 boring were also tested for additional general chemistry parameters, metals, and SVOCs (Table 1). As shown in Table 2, no SVOCs were detected and results for general chemistry and metals were typically similar with no discernible trends associated with sample depth. No soil sample results exceeded TTLC hazardous waste criteria (Table 2).

3.2 Surface Water Sample Results

Field parameters and analytical results from the surface water samples are presented in Table 3 alongside any applicable or relevant and appropriate requirements (ARARs). ARARs consist of State and/or Federal drinking water standards, as well as water quality objectives (WQOs) set in the RWQCB- San Diego Region Basin Plan for the Middle Sweetwater Hydrologic Area in which the site is located. Field notes and laboratory analytical reports from the surface water sampling events are provided in Appendix B.

As indicated on the field notes in Appendix B, the upstream and downstream surface water monitoring locations were noted as having laminar flow with clear water, while the midstream monitoring location was noted as having turbid flow with brown water. The difference in stream observations at the midstream location compared to upstream and downstream locations is the product of several factors:

- The upstream location and midstream samples were collected on the same day (April 10, 2020) during heavy precipitation. During the event, drainage from Mexican Canyon was flowing turbidly into Sweetwater River approximately 2,000 feet upgradient from the midstream monitoring location. Mexican Canyon drains residential areas and a golf course to the south. This would have only affected the midstream sampling location because the upstream location is upgradient of where Mexican Canyon discharges into Sweetwater River

and the downstream sampling location was sampled on a different day (April 14, 2020) when there was no inflow from Mexican Canyon.

- The upstream sampling location is downgradient of a heavily vegetated portion of Sweetwater River. This setting is expected to provide a filtering effect on surface water flows. Between the upstream and midstream monitoring locations there is little to no vegetation within the Sweetwater River. Therefore, fast-moving water is likely to put solids into suspension between the upstream and midstream monitoring points. Between the midstream and downstream monitoring locations, Sweetwater River widens and energy within the stream is reduced, allowing solids to settle.
- Flow rates for the Sweetwater River were high during sampling of the upstream and midstream monitoring locations, as sampling was conducted during a storm event (April 10, 2020). Flow rates in the Sweetwater River were lower during sampling of the downstream monitoring location, as sampling was performed after the storm event had occurred (April 14, 2020).

As shown on Table 3, water chemistry between the upstream and downstream monitoring points is generally consistent, while several results were elevated for the midstream monitoring point. Elevated monitoring parameters at the midstream monitoring location are associated with the aforementioned bulleted points regarding stream conditions during sampling. For example, turbidity was relatively low at the upstream and downstream monitoring locations (6 to 20 NTU), while it was out of range (>800 NTU) for the midstream monitoring location.

Similarly, TSS concentrations were relatively low and ranged from 8.2 to 14 mg/L in upstream and downstream samples, but these concentrations were significantly elevated (2400 mg/L) at the midstream monitoring location. Furthermore, since metals are analyzed as total, elevated metals concentrations at the midstream monitoring location (typically elevated by an order of magnitude compared to the other surface water samples) reflect elevated sediment loads in the midstream sample. Nutrients were also typically slightly elevated in the midstream sample relative to upstream and downstream samples. The results obtained generally characterize surface water chemistry for two scenarios:

1. Surface water chemistry of laminar flow within Sweetwater River;
2. Surface water chemistry of turbulent flow within Sweetwater River, including influences from Mexican Canyon, which flows across Phase 2 prior to discharging into Sweetwater River.

Regardless of flow scenarios listed above, surface water chemistry in samples collected from the Sweetwater River (Table 3) within the project area is characterized as follows:

- High concentrations of coliform (all samples measured at maximum reporting limit), including E. Coli.
 - ◊ E. Coli is elevated at the upstream monitoring location (>2.5 times higher) compared to midstream and downstream monitoring locations.
- Absent of several anthropogenic and/or organic compounds, including: chlorinated herbicides, organochlorine pesticides, polychlorinated biphenyls (PCBs), SVOCs, and VOCs.
- Metals concentrations that are typically below MCLs and WQOs, except for:
 - ◊ Iron results elevated above the State secondary MCL(SMCL) and WQO at upstream and midstream monitoring locations.
 - ◊ Lead results elevated above the primary State and federal MCL.
 - ◊ Manganese results elevated above the State SMCL and WQO at upstream and midstream monitoring locations.
- General chemistry concentrations that are typically below MCLs and WQOs, except for:
 - ◊ Phosphorous results elevated above WQO at upstream and midstream monitoring locations.
 - ◊ Ratios of nitrogen to phosphorous range from approximately 5:1 to 14:1.

3.3 Groundwater Sample Results

Existing groundwater wells at the golf course are not being used as a source of potable water and will not be used as a potable water source during mining operations and area reclamation. The County has mapped potential nitrate and radioactive element problem areas within the County and presented them on a map within the Guidelines for Determining Significance – Groundwater Resources. The project site does not fall within either problem area. This conclusion is supported by limited general chemistry water quality data that has been collected by the SWA at the Ivanhoe #11 and Lakes #11 wells between 1989 and 2017.

Field parameters and analytical results from the groundwater samples are presented in Table 4 alongside their ARARs. Field notes from the groundwater sampling event and laboratory analytical reports are provided in Appendix B.

As shown in Table 4, generally the analytical results are similar between groundwater samples, and few results exceeded ARARs. Groundwater chemistry in samples collected from groundwater wells within the project area is characterized as follows:

- Absent of several anthropogenic and/or organic compounds, including: chlorinated herbicides, organochlorine pesticides, PCBs, SVOCs, and VOCs.
- Absent of E. Coli.
- Varying presence of coliform, from non-detect (Ivanhoe #8), to 88 MPN/100mL (Ivanhoe #11), to greater than 2400 MPN/100mL (Lakes #11).
- Slightly elevated TDS concentrations that exceed the SMCL and WQO.
- Elevated manganese and iron concentrations that generally exceed the SMCL and WQO. However, iron was not detected at well Ivanhoe #8 and the manganese concentration at this well was an order of magnitude less than the other wells sampled.
- Slightly elevated chloride concentrations that exceeded the SMCL and WQO in the sample from Lakes #11. Chloride in the other two wells sampled was measured very close to the WQO.

No other laboratory-analyzed parameters exceeded ARARs. Inconsistencies in the groundwater sampling results include varying presence of coliform between all wells and elevated concentrations of total nitrogen, TKN, and chloride at Lakes #11 compared with Ivanhoe #8 and Ivanhoe #11. In addition, the Ivanhoe #11 sample contained higher concentrations of lead and zinc relative to the other two wells monitored.

3.4 Summary

Results of the soil, surface water, and groundwater sampling indicate water quality at the Project site generally meet WQO and Federal and State MCLs, with the exception of exceedances of some SMCLs for specific conductance, TDS, iron, and manganese and one exceedance of pH in surface water. Surface water pH was just under the federal MCL of 6.5 at the midstream surface water sample location. Based on these results, generally the water quality related to dissolved content (as monitored by specific conductance and TDS concentrations) and iron and manganese is relatively poor, most likely associated with naturally occurring metals from the surrounding bedrock, while all other constituents appear to meet drinking water standards.

4. Summary of Project Impacts and Mitigations

Mining operations and initial reclamation activities have the potential to create temporary impacts to water quality. Ground disturbance may release particulates into the receiving water and into stormwater. However, compliance with current federal, State and local Clean Water

regulations, including the Industrial General Permit, which requires implementation of an approved Stormwater Pollution Prevention Plan (SWPPP), will reduce impacts to the water quality. The industrial general permit will require stormwater analyses of pH, TSS, oil and grease, and nitrate+nitrite due to the SIC code associated with sand and gravel mining. Furthermore, the SWPPP will require implementing project-specific Best Management Practices (BMPs) to control erosion and mixing of sediment with stormwater. Source control and good housekeeping are also essential to reduce water quality impacts to less than significant levels.

The project proposes to work in phases, limiting the area of ground disturbance. The Cottonwood Sand Mine Project does not propose to use any hazardous products. With the exception of some petroleum products (e.g., fuels) for its equipment, few pollutants of concern will be required for the mining operation. Once an area has been mined, it will be reclaimed, revegetated, and irrigated to establish plant communities. The established reclamation areas will capture runoff, allowing the water to infiltrate back into the ground, decreasing the discharge from the project site and improving water quality.

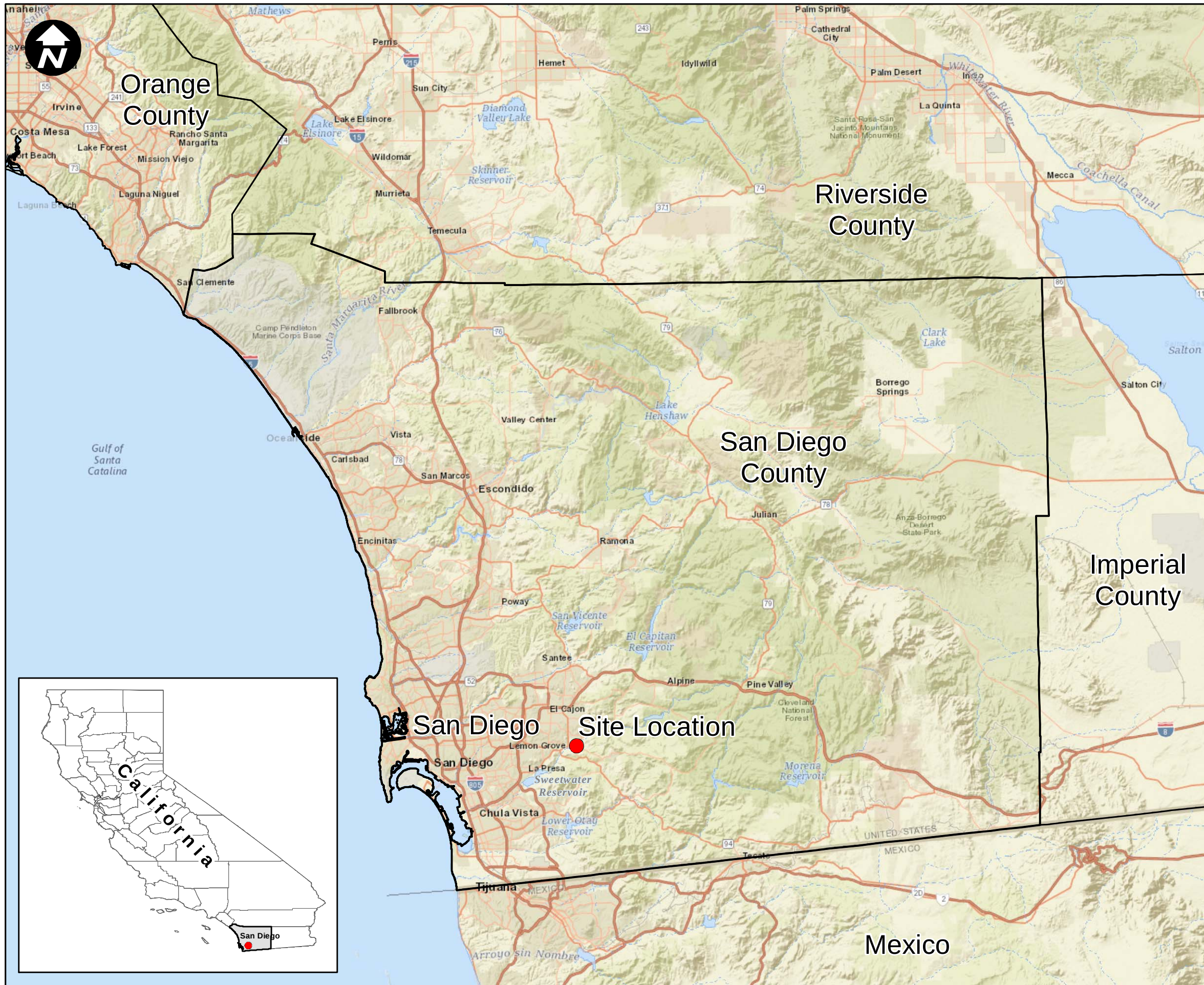
At the completion of the project the project will be restored to a riparian corridor with adjacent upland areas with trails. Potential impacts to the water quality after completion will be less than significant.

5. References

ASTM D 2488. Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

Geo-Logic Associates, 2020, Site Water Quality Evaluation Work Plan, Cottonwood Sand Mine Environmental Impact Report (EIR), El Cajon, California, March.

NBS Lowry Engineers and Planners, 1990, Middle Sweetwater River System, Water Resources Management Study, Volume I, December.



Explanation

- Site location

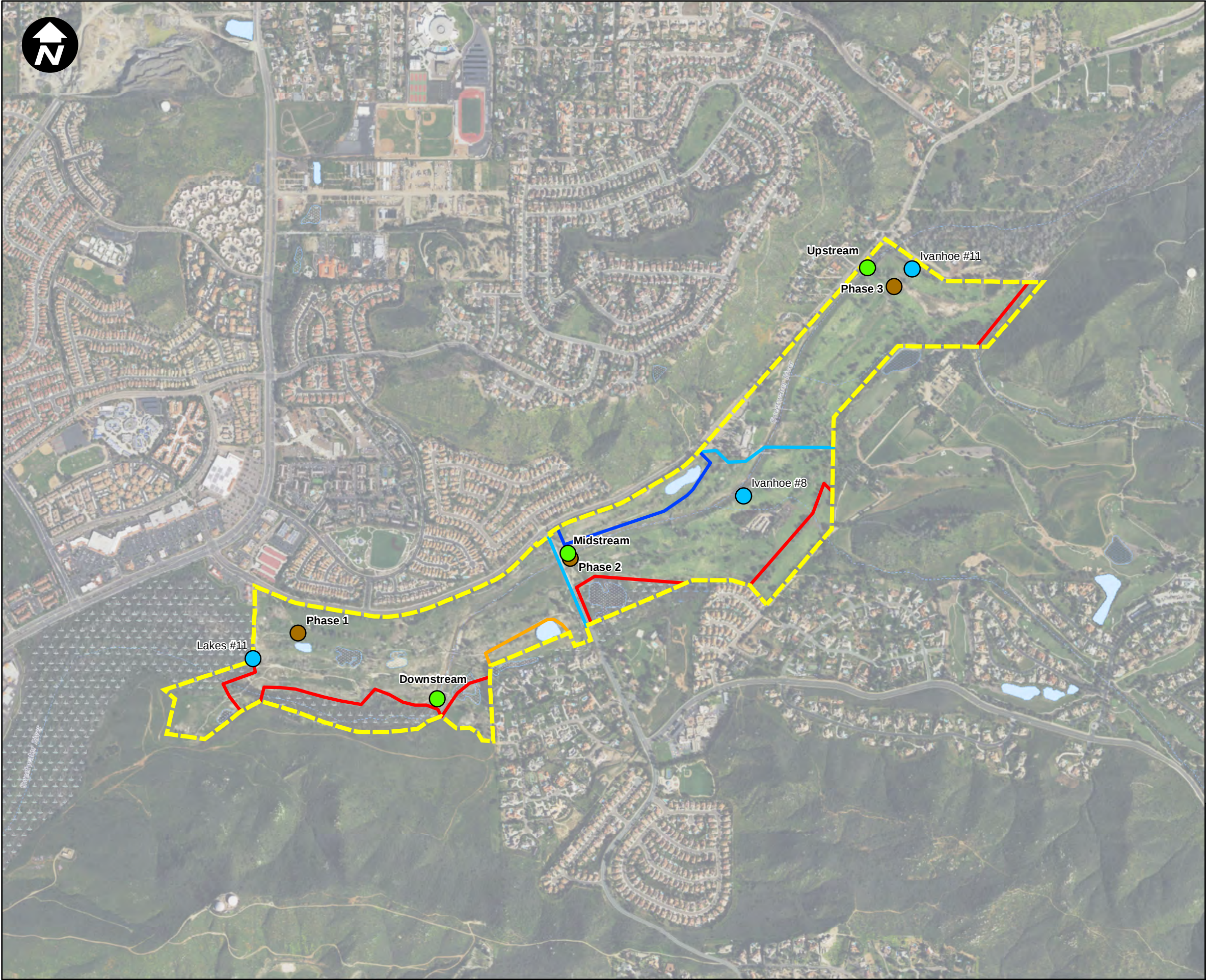
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

0 5 10
Miles

Geo-Logic
ASSOCIATES

Figure 1
Site Location Map

Cottonwood Sand Mine



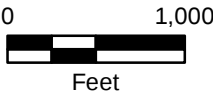
Explanation

- Surface water sample
- Water well
- Soil boring

Project Areas

- No mining areas
- Mined prior to 1966
- Cottonwood Project boundary
- Project phasing lines
- Proposed plant location

Service Layer Credits: USGS The National Map: National Hydrography Dataset. Data refreshed March, 2020.
USGS The National Map: Orthoimagery. Data refreshed October, 2020.



Geo-Logic
ASSOCIATES

Figure 2
Site Plan

Cottonwood Sand Mine

KEY TO TABLES

COTTONWOOD SAND MINE

-  - Value listed (right-justified) indicates analyte was detected above the Practical Quantitation Limit (PQL).
-  - Not detected above PQL; value listed is MDL (left-justified) or estimated trace concentration (right-justified; **BOLDED**).
-  - Sample was not analyzed for these parameters during the specified sampling round.
-  - Indicates exceeds Applicable or Relevant and Appropriate Requirement (ARAR).

- (1) California Primary Drinking Water Standard.
- (2) California Secondary Drinking Water Standard.
- (3) Federal Primary Maximum Contaminant Limit (MCL).
- (4) Federal Secondary MCL.
- (5) Middle Sweetwater Hydrologic Unit Water Quality Objective
- (6) Suspected Field/Laboratory Contaminant.
- (e) Holding time exceeded.

NV = No Value

^A = San Diego Basin Plan notes "A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/L total Phosphorous.

^B = San Diego Basin Plan notes "Natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld.

TABLE 1
ANALYTICAL METHODS

SOIL MONITORING PARAMETERS - SAMPLES FROM ALL BORINGS (PH-1, PH-2, & PH-3)	
PARAMETER	TEST METHOD
Chlorinated Herbicides	EPA 8151A
Lead	6010B
Organochlorine Pesticides	EPA 8081A
Total Organic Carbon	EPA 9060A
Volatile Organic Compounds (VOCs)	EPA 8260B
SOIL MONITORING PARAMETERS - SAMPLES FROM BORING PH-2	
PARAMETER	TEST METHOD
Iron	EPA 6010B
Manganese	EPA 6010B
Nitrate as Nitrogen	EPA 300.0
Oil and Grease	EPA 1664A HEM
Semi-Volatile Organic Compounds (SVOCs)	EPA 8270C
Title 22 Metals	EPA 6020 (EPA 7471A for Mercury)
Totak Kjeldahl Nitrogen	EPA 351.2
Total Nitrogen	Calculation
Total Organic Carbon	EPA 9060A
Total Phosphorous	EPA 365.4

GROUNDWATER & SURFACE WATER MONITORING PARAMETERS ¹	
PARAMETER	TEST METHOD
Chloride	EPA 300.0
Chlorinated Herbicides	EPA 515.1
Iron	EPA 200.7
Manganese	EPA 200.7
Methyl Blue Active Substance (MBAS)	EPA 6010B
Nitrate as Nitrogen	EPA 300.0 ²
Nitrite (as Nitrogen)	EPA 353.2 ³
Oil and Grease	EPA 1664
Organophosphorous Pesticides	EPA 508
Polychlorinated Byphenyls (PCBs)	EPA 508
Semi-Volatile Organic Compounds (SVOCs)	EPA 525.2
Sulfate	EPA 300.0
Title 22 Metals	EPA 200.8 (EPA 245.1 for Mercury)
Total Coliform & E. Coli	SM 9223
Total Dissolved Solids	EPA 160.1
Total Kjeldahl Nitrogen	EPA 351.2
Total Nitrogen	Calculation
Total Organic Carbon	EPA 415.1
Total Phosphorous	EPA 365.4
Total Suspended Solids	EPA 160.2
Volatile Organic Compounds (VOCs)	EPA 524.2

Notes:

1. Nitrite (as N) & Total Organic Carbon inadvertently not analyzed in Downstream surface water sample.

2. Also analyzed by EnviroMatrix Analytical, Inc. by EPA 353.2

3. Also analyzed by EnviroMatrix Analytical, Inc. by SM4500

TABLE 2
SOIL SAMPLE COMPARISON DATA

Analyte	Units	1-0.5 3/6/2020	1-1.5 3/6/2020	1-11 3/6/2020	2-0.5 3/20/2020	2-1.5 3/20/2020	2-6 3/20/2020	3-0.5 3/6/2020	3-1.5 3/6/2020	3-21 3/6/2020	TTLc	Median	Average	Stdev	Minimum	Maximum
General Chemistry																
Nitrate as N	mg/kg	NA	NA	NA	1.8	1.2	2.9	NA	NA	NA	NA	1.8	1.97	0.86	1.2	2.9
Total Kjeldahl Nitrogen	mg/kg	NA	NA	NA	200	190	200	NA	NA	NA	NA	200	196.67	5.77	190	200
Total Nitrogen	mg/kg	NA	NA	NA	200	190	210	NA	NA	NA	NA	200	200.00	10.00	190	210
Total Organic Carbon	mg/kg	8020	2000	1300	520	<500	770	5190	3050	<565	NA	2000	2978.57	2738.89	520	8020
Total Phosphorus	mg/kg	NA	NA	NA	230	370	340	NA	NA	NA	NA	340	313.33	73.71	230	370
Metals																
Antimony	mg/kg	NA	NA	NA	<0.080	<0.080	<0.080	NA	NA	NA	500	NC	NC	NC	NC	NC
Arsenic	mg/kg	NA	NA	NA	0.59	0.38	0.84	NA	NA	NA	500	0.59	0.60	0.23	0.38	0.84
Barium	mg/kg	NA	NA	NA	44	30	63	NA	NA	NA	10000	44	45.67	16.56	30	63
Beryllium	mg/kg	NA	NA	NA	0.066	<0.041	0.094	NA	NA	NA	75	0.08	0.08	0.02	0.066	0.094
Cadmium	mg/kg	NA	NA	NA	<0.048	<0.048	<0.048	NA	NA	NA	100	NC	NC	NC	NC	NC
Chromium	mg/kg	NA	NA	NA	8.3	5.5	9.6	NA	NA	NA	2500	8.3	7.80	2.10	5.5	9.6
Cobalt	mg/kg	NA	NA	NA	3.2	1.6	3.7	NA	NA	NA	8000	3.2	2.83	1.10	1.6	3.7
Copper	mg/kg	NA	NA	NA	7.3	3.4	8.0	NA	NA	NA	2500	7.3	6.23	2.48	3.4	8
Iron	mg/kg	NA	NA	NA	10000	9000	12000	NA	NA	NA	NA	10000	10333.33	1527.53	9000	12000
Lead	mg/kg	4.2	7.1	NA	1.7	0.73	1.3	6.7	3.4	NA	1000	3.4	3.59	2.56	0.73	7.1
Magnesium	mg/kg	NA	NA	NA	2000	1100	2100	NA	NA	NA	NA	2000	1733.33	550.76	1100	2100
Mercury	mg/kg	NA	NA	NA	<0.016	<0.016	<0.016	NA	NA	NA	20	NC	NC	NC	NC	NC
Molybdenum	mg/kg	NA	NA	NA	0.13	0.096	0.26	NA	NA	NA	3500	0.13	0.16	0.09	0.096	0.26
Nickel	mg/kg	NA	NA	NA	3.2	1.8	4.1	NA	NA	NA	2000	3.2	3.03	1.16	1.8	4.1
Selenium	mg/kg	NA	NA	NA	<0.11	<0.11	<0.11	NA	NA	NA	100	NC	NC	NC	NC	NC
Silver	mg/kg	NA	NA	NA	<0.051	<0.051	<0.051	NA	NA	NA	500	NC	NC	NC	NC	NC
Thallium	mg/kg	NA	NA	NA	0.078	<0.049	0.11	NA	NA	NA	700	0.094	0.09	0.02	0.078	0.11
Vanadium	mg/kg	NA	NA	NA	29	20	30	NA	NA	NA	2400	29	26.33	5.51	20	30
Zinc	mg/kg	NA	NA	NA	18	9.1	21	NA	NA	NA	5000	18	16.03	6.19	9.1	21
Chlorinated Herbicides (mg/kg) : ND																
Organochlorine Pesticides																
4,4'-DDD	mg/kg	<0.000064	<0.000064	<0.000064	<0.000064	<0.000064	<0.000064	0.00037	<0.000064	<0.000064	1.0	0.00037	0.00	NC	0.00037	0.00037
4,4'-DDE	mg/kg	<0.000095	0.00039	<0.000095	<0.000095	<0.000095	<0.000095	0.0011	0.00020	<0.000095	1.0	0.00039	0.0006	0.0005	0.0002	0.0011
4,4'-DDT	mg/kg	0.00015	0.00058	<0.00004	<0.00004	<0.00004	<0.00004	0.0008	0.00023	<0.00004	1.0	0.000405	0.0004	0.0003	0.00015	0.00076
Petroleum Hydrocarbons																
Oil and Grease	mg/kg	NA	NA	NA	16	<16	<16	NA	NA	NA	NA	16	16	NC	16	16
SVOC (mg/kg) : ND																
VOC (mg/kg) : ND																

Notes:

##	- No shading, right-justified: Value listed indicates analyte was detected above the Practical Quantitation Limit (PQL).
##	- Shaded, right justified and bolded: value listed is an estimated trace concentration (measured between the method detection limit and PQL).
##	- Shaded, left-justified: Not detected. Value listed is the method detection limit.

TABLE 3
WATER QUALITY COMPARISON - SURFACE WATER

ANALYTE	Upstream		Midstream		Downstream	ARARs
	4/10/2020	4/14/2020	4/10/2020	4/14/2020	4/14/2020	
FIELD PARAMETERS						
Oxygen, Dissolved (mg/L)	8.72	NA	10.00	NA	7.56	NV
ORP (MV)	163	NA	191	NA	165	NV
pH (units)	6.88	NA	6.38	NA	6.70	6-8 (4)
Specific Conductance (mS/cm)	3.71	NA	4.64	NA	1.10	1.6(2)
Temperature (°C)	14.79	NA	14.75	NA	19.07	NV
Turbidity (NTU)	20	NA	>800	NA	6.0	1(1,3) / 5(2) / 20(5)
GENERAL CHEMISTRY (mg/L):						
Chloride	50	NA	28	NA	150	250(5) / 500(2)
MBAS	<0.025	NA	<0.025	NA	0.050	0.5(2,4,5)
Nitrate (as N)	0.25	0.30	0.99	0.40	0.42 & 0.38	10(1,3)
Nitrite (as N)	<0.01	0.009	<0.01	0.01	NA	1(1,3)
Sulfate	47	NA	21	NA	58	250(5) / 500(2)
Total Nitrogen	0.97	NA	5.1	NA	1	NV ^B
Total Kjeldahl Nitrogen	0.73	NA	4.1	NA	0.6	NV
Total Organic Carbon	8.2	NA	33	NA	NA	NV
Total Phosphorus	0.12	NA	1.0	NA	0.069	0.1(5 ^A)
Total Suspended Solids (Glass Fiber)	14	NA	2400	NA	8.2	NV
Total Dissolved Solids (TDS)	350	NA	280	NA	570	500 (5) / 1000(2)
BACTERIOLOGICAL (MPN/100 mL):						
Total Coliform	>2400	>24200	>2400	>24200	>24200	NV
E. Coli	2000	548	1100	194	201	NV
METALS (mg/L):						
Total Recoverable Antimony	0.00036	NA	0.00024	NA	0.00016	0.006(1,3)
Total Recoverable Arsenic	<0.0007	NA	0.0033	NA	0.0015	0.01(1,3)
Total Recoverable Barium	0.032	NA	0.27	NA	0.062	1(1) / 2(3)
Total Recoverable Beryllium	<0.00014	NA	0.00065	NA	<0.00014	0.004(1,3)
Total Recoverable Cadmium	<0.00011	NA	0.00044	NA	<0.00011	0.005(1,3)
Total Recoverable Chromium	0.00092	NA	0.032	NA	<0.0005	0.05(1) / 0.1(3)
Total Recoverable Cobalt	0.00071	NA	0.026	NA	0.00049	NV
Total Recoverable Copper	0.0057	NA	0.085	NA	0.0025	1.3(1,3) / 1(2)
Total Recoverable Iron	0.8	NA	21	NA	0.24	0.3(2,5)
Total Recoverable Lead	0.00066	NA	0.023	NA	0.00028	0.015(1,3)
Total Recoverable Manganese	0.14	NA	0.91	NA	0.049	0.05(2,5)
Total Recoverable Mercury	0.000035	NA	<0.000022	NA	<0.000022	0.002(1,3)
Total Recoverable Molybdenum	0.0023	NA	0.00077	NA	0.0033	NV
Total Recoverable Nickel	0.0018	NA	0.024	NA	0.0021	0.1(1)
Total Recoverable Selenium	<0.00019	NA	<0.00038	NA	0.0019	0.05(1,3)
Total Recoverable Silver	<0.00010	NA	<0.00020	NA	<0.00010	0.1(2)
Total Recoverable Thallium	<0.00010	NA	0.00050	NA	<0.00010	0.002(1,3)
Total Recoverable Vanadium	0.0096	NA	0.12	NA	0.0063	NV
Total Recoverable Zinc	0.016	NA	0.17	NA	0.003	5(2)
OIL & GREASE (mg/L)	<0.66	NA	<0.66	NA	<0.66	no visible film
CHLORINATED HERBICIDES (µg/L): ND						
ORGANOCHLORINE PESTICIDES AND PCBs (µg/L): ND						
SVOCs (µg/L): ND						
VOCs (µg/L): ND						

Notes:

- No shading, right-justified: Value listed indicates analyte was detected above the Practical Quantitation Limit (PQL).
- Shaded, right justified and bolded: value listed is an estimated trace concentration (measured between the method detection limit and PQL).
- Shaded, left-justified: not detected. Value listed is the method detection limit.

- | | |
|---|---------------------------|
| (1) <u>California Primary Drinking Water Standard.</u> | NA - <u>not analyzed.</u> |
| (2) <u>California Secondary Drinking Water Standard.</u> | NV - <u>no value.</u> |
| (3) <u>Federal Primary Maximum Contaminant Limit (MCL).</u> | ND - <u>not detected.</u> |
| (4) <u>Federal Secondary MCL.</u> | |
| (5) <u>Middle Sweetwater Hydrologic Unit Water Quality Objective.</u> | |

^A = San Diego Basin Plan notes "A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/L total phosphorus.

^B = San Diego Basin Plan notes "Natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld.

TABLE 4
WATER QUALITY COMPARISON - GROUNDWATER

ANALYTE	IVANHOE GOLF COURSE		LAKES GOLF COURSE	ARARs
	IVANHOE #11 10/01/20	IVANHOE #8 10/01/20	LAKES #11 10/01/20	
FIELD PARAMETERS:				
Dissolved Oxygen (mg/L)	NA	NA	1.36	NV
pH (units)	7.07	6.56	7.71	6-8 (4)
ORP (MV)	213	244	-89	NV
Specific Conductance (µs/cm)	2450	2450	2920	1600(2)
Temperature (°C)	24.40	20.83	23.29	NV
Turbidity (NTU)	72	1.3	4.7	1(1,3) / 5(2,5)
GENERAL CHEMISTRY (mg/L):				
Chloride	390	380	630	400(5) / 500(2)
MBAS	<0.048	<0.024	0.024	0.5(2,4,5)
Nitrate (as N)	2.0	2.6	0.61	10(1,3)
Nitrite (as N)	<0.01	0.064	0.1	1(1,3)
Sulfate	410	400	310	500(2,5)
Total Kjeldahl Nitrogen	0.57	0.39	23	NV
Total Nitrogen	2.6	3.1	24	NV
Total Organic Carbon	4.2	3.9	8.4	NV
Total Phosphorus	0.12	<0.018	<0.090	NV
Total Suspended Solids (Glass Fiber)	6.0	<0.56	7.6	NV
Total Dissolved Solids (TDS)	1500	1600	1900	1000(2,5)
BACTERIOLOGICAL (MPN/100 mL):				
Total Coliform	88	<1	>2400	NV
E. Coli	<1	<1	<1	NV
METALS (mg/L):				
Total Recoverable Antimony	0.00016	<0.00011	0.00013	0.006(1,3)
Total Recoverable Arsenic	0.002	<0.0007	0.0024	0.01(1,3)
Total Recoverable Barium	0.18	0.14	0.12	1(1)/ 2(3)
Total Recoverable Beryllium	<0.00014	<0.00014	<0.00014	0.004(1,3)
Total Recoverable Cadmium	0.00032	0.00015	0.00019	0.005(1,3)
Total Recoverable Chromium	0.0019	<0.0005	<0.0005	0.05(1)/0.1(3)
Total Recoverable Cobalt	0.0053	0.0025	0.011	NV
Total Recoverable Copper	0.062	0.0037	0.0028	1.3(1,3) / 1(2)
Total Recoverable Iron	2.9	<0.030	1.1	0.3(2,5)
Total Recoverable Lead	0.0064	0.00017	0.00016	0.015(1,3)
Total Recoverable Manganese	1.7	0.14	1.2	0.05(2,5)
Total Recoverable Mercury	0.00040	0.00013	0.00020	0.002(1,3)
Total Recoverable Molybdenum	0.017	0.0095	0.31	NV
Total Recoverable Nickel	0.0058	0.0041	0.0048	0.1(1)
Total Recoverable Selenium	0.011	0.014	0.0022	0.05(1,3)
Total Recoverable Silver	<0.00010	<0.00010	<0.00010	0.1(2)
Total Recoverable Thallium	<0.00010	<0.00010	<0.00010	0.002(1,3)
Total Recoverable Vanadium	0.12	0.041	0.0036	NV
Total Recoverable Zinc	0.12	0.0039	0.019	5(2)
OIL & GREASE	<0.74	<0.74	<0.74	NV
CHLORINATED HERBICIDES (µg/L): ND				
ORGANOCHLORINE PESTICIDES AND PCBs (µg/L): ND				
SVOCs (µg/L): ND				
VOCs (µg/L): ND				

Notes:

- No shading, right-justified: Value listed indicates analyte was detected above the Practical Quantitation Limit (PQL).
- Shaded, right justified and bolded: value listed is an estimated trace concentration (measured between the method detection limit and PQL).
- Shaded, left-justified: not detected. Value listed is the method detection limit.

- | | |
|---|--------------------|
| (1) <u>California Primary Drinking Water Standard.</u> | NA - not analyzed. |
| (2) <u>California Secondary Drinking Water Standard.</u> | NV - no value. |
| (3) <u>Federal Primary Maximum Contaminant Limit (MCL).</u> | ND - not detected. |
| (4) <u>Federal Secondary MCL.</u> | |
| (5) <u>Middle Sweetwater Hydrologic Unit Water Quality Objective.</u> | |

Appendix A

Boring Logs

Geo-Logic Associates

Boring Log

BORING NO.: PH-1

PAGE: 1 OF 1

JOB NO.: S020.1016
SITE LOCATION: COTTONWOOD GOLF COURSE
DRILLING METHOD: HOLLOW STEM AUGER
CONTRACTOR: ABC DRILLING
LOGGED BY: K. WELCHANS

DATE STARTED: 3/06/20
DATE FINISHED: 3/06/20
ESTIMATED ELEVATION: 330 feet
ESTIMATED LATITUDE: 32° 44' 32.02" N
ESTIMATED LONGITUDE: -116° 55' 37.01" W

GW DEPTH: 8 feet
TOTAL DEPTH: 30.5 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11:33				Bulk Bulk	1-0.5 1-1.5	0			SW	Brown (7.5YR 5/3), well-graded SAND.	...(0'-5') - cleared with hand tools. PVC line encountered and boring moved ~2' to the East.
									SC	Strong brown (5YR 4/6), fine CLAYEY SAND.	
			18	2.5		5			SC	Strong brown (5YR 4/6), medium dense, fine to coarse, well-graded CLAYEY SAND with minor GRAVEL.	
									SC-CL	Black (5YR 2.5/1), fine CLAYEY SAND to SANDY CLAY.	...(7') - moist cuttings.
			16	2.5	1-11	10			SW	Dark reddish brown (5YR 2.5/2), medium dense, fine to coarse, well-graded SAND.	
									CL	Dark reddish brown (5YR 2.5/2), very stiff, fine SANDY CLAY.	
			21	2.5	1-16	15				...(15') - color change to very dary grayish brown (10YR 3/2).	
			23	2.5	1-21	20			CL	Dark brown (7.5YR 3/2), very stiff, fine SANDY CLAY.	
			23	2.5	1-26	25			SP	Brown (10YR 5/3), poorly graded, coarse SAND.	
										Tonalite and metavolcanic GRAVEL.	...(30') - poor sample recovery. ~1/2" to 3" gravel pulled out of auger and bit after auger was tripped out of boring.
12:30			50/6"	2.5		30			GP		
										Notes:	...(30.5') - refusal.
						35				1. Total depth of boring 30.5 feet below ground surface (bgs) due to refusal.	
						40				2. Groundwater measured at 8 feet (bgs).	
						45				3. Samples 1-0.5, 1-1.5, 1-11 submitted for laboratory analysis (environmental).	
						50				4. Borehole backfilled with grout slurry with 5% bentonite by weight.	

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

Geo-Logic Associates

Boring Log

BORING NO.: PH-2

PAGE: 1 OF 1

JOB NO.: S020.1016
 SITE LOCATION: COTTONWOOD GOLF COURSE
 DRILLING METHOD: HOLLOW STEM AUGER
 CONTRACTOR: ABC DRILLING
 LOGGED BY: K. WELCHANS

DATE STARTED: 3/20/20
 DATE FINISHED: 3/20/20
 ESTIMATED ELEVATION: 341 feet
 ESTIMATED LATITUDE: 32° 44' 40.52" N
 ESTIMATED LONGITUDE: -116° 54' 59.36" W

GW DEPTH: 5 feet
 TOTAL DEPTH: 40 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
8:05				Bulk Bulk	2-0.5 2-1.5	0			SP	Very dark grayish brown (10YR 3/2), fine to coarse (mostly fine), poorly graded SAND. ...(1') - grades to mostly coarse SAND.	...(0'-5') - cleared with hand tools.
			8	2.5	2-6	5			SC	Very dark grayish brown (10YR 3/2), fine to coarse CLAYEY SAND.	
			38	2.5	2-11	10			SM	Very dark grayish brown (10YR 3/2), loose SILTY SAND. ...(7') - plus CLAY.	...(5') - wet cuttings.
			36	2.5	2-16	15			SM	Very dark grayish brown (10YR 3/2), dense, fine to coarse, well-graded SILTY SAND.	
			53	2.5	2-21	20			SP	Brown (10YR 4/3), dense, fine to coarse (mostly coarse), poorly graded SAND. ...(20') - very dense, medium to coarse.	
			20	2.5	2-26	25				...(25') - medium dense.	
			30	2.5		30					...(30') - no sample recovered.
			50/4"	2.5	2-36	35			SW	Brown (10YR 4/3), very dense, fine to coarse, well-graded SAND. ...(33') - rig chatter and locking.	...(36') - smooth drilling.
			50/5"	2.5	2-40	40			SW	Brown (10YR 4/3), very dense, fine to coarse SILTY SAND with tonalite GRAVEL up to 1.5" in size.	
						45				Notes: 1. Total depth of boring 40 feet below ground surface (bgs). 2. Groundwater measured at 5 feet (bgs). 3. Samples 2-0.5, 2-1.5, 2-6 submitted for laboratory analysis (environmental). 4. Borehole backfilled with grout slurry with 5% bentonite by weight.	
						50					

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

Geo-Logic Associates

Boring Log

BORING NO.: PH-3

PAGE: 1 OF 1

JOB NO.: S020.1016
 SITE LOCATION: COTTONWOOD GOLF COURSE
 DRILLING METHOD: HOLLOW STEM AUGER
 CONTRACTOR: ABC DRILLING
 LOGGED BY: K. WELCHANS

DATE STARTED: 3/06/20
 DATE FINISHED: 3/06/20
 ESTIMATED ELEVATION: 369 feet
 ESTIMATED LATITUDE: 32° 45' 11.37" N
 ESTIMATED LONGITUDE: -116° 54' 17.35" W

GW DEPTH: 20 feet
 TOTAL DEPTH: 40 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
8:13				Bulk	3-0.5 3-1.5	0			SW	Dark brown (7.5YR 3/3), fine to coarse SAND with GRAVEL. ...(1') - color change to dark reddish brown (5YR 3/3).	...(0'-5') - cleared with hand tools.
			28	2.5		5			CL	Dark reddish brown (5YR 2.5/2) SANDY CLAY. ...(5') - very stiff.	
			27	2.5		10			SW	Dark gray (5YR 4/1), fine to coarse, well-graded SAND with GRAVEL. ...(10') - medium dense. ...(11') - no GRAVEL.	
			24	2.5		15			CL	Very dark gray (5YR 3/1), very stiff, fine to medium SANDY CLAY.	
			30	2.5	3-21	20			SW	Very dark gray (5YR 3/1), medium dense, fine to coarse, well-graded SAND. ...(25') - color change to dark gray (5YR 4/1) and increase in coarse SAND content.	...(20') - wet cuttings.
			21	2.5	3-26	25					
			21	2.5	3-31	30					
			25	2.5	3-36	35					
9:22			25	2.5	3-40	40					
						45					
						50					

Notes:

1. Total depth of boring 40 feet below ground surface (bgs).
2. Groundwater measured at 20 feet (bgs).
3. Samples 3-0.5, 3-1.5, 3-21 submitted for laboratory analysis (environmental).
4. Borehole backfilled with grout slurry with 5% bentonite by weight.

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

Appendix B

Soil, Surface Water, and Groundwater Field Notes and Laboratory Reports



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 05/05/2020

Sarah Battelle

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Client Project: S020.1016
BCL Project: Cottonwood
BCL Work Order: 2008288
Invoice ID: B379135

Enclosed are the results of analyses for samples received by the laboratory on 3/17/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	3
Laboratory / Client Sample Cross Reference.....	6

Sample Results

2008288-01 - 3-0.5	
Organochlorine Pesticides (EPA Method 8081A).....	8
Chlorinated Herbicides (EPA Method 8151A).....	9
Volatile Organic Analysis (EPA Method 8260B).....	10
Total Concentrations (TTLC).....	13
2008288-02 - 3-1.5	
Organochlorine Pesticides (EPA Method 8081A).....	14
Chlorinated Herbicides (EPA Method 8151A).....	15
Volatile Organic Analysis (EPA Method 8260B).....	16
Total Concentrations (TTLC).....	19
2008288-03 - 3-21	
Organochlorine Pesticides (EPA Method 8081A).....	20
Chlorinated Herbicides (EPA Method 8151A).....	21
Volatile Organic Analysis (EPA Method 8260B).....	22
2008288-08 - 1-0.5	
Organochlorine Pesticides (EPA Method 8081A).....	25
Chlorinated Herbicides (EPA Method 8151A).....	26
Volatile Organic Analysis (EPA Method 8260B).....	27
Total Concentrations (TTLC).....	30
2008288-09 - 1-1.5	
Organochlorine Pesticides (EPA Method 8081A).....	31
Chlorinated Herbicides (EPA Method 8151A).....	32
Volatile Organic Analysis (EPA Method 8260B).....	33
Total Concentrations (TTLC).....	36
2008288-10 - 1-11	
Organochlorine Pesticides (EPA Method 8081A).....	37
Chlorinated Herbicides (EPA Method 8151A).....	38
Volatile Organic Analysis (EPA Method 8260B).....	39

Quality Control Reports

Organochlorine Pesticides (EPA Method 8081A)	
Method Blank Analysis.....	42
Laboratory Control Sample.....	43
Precision and Accuracy.....	44
Chlorinated Herbicides (EPA Method 8151A)	
Method Blank Analysis.....	45
Laboratory Control Sample.....	46
Precision and Accuracy.....	47
Volatile Organic Analysis (EPA Method 8260B)	
Method Blank Analysis.....	48
Laboratory Control Sample.....	52
Precision and Accuracy.....	53
Total Concentrations (TTLC)	
Method Blank Analysis.....	55
Laboratory Control Sample.....	56
Precision and Accuracy.....	57

Subcontract Reports

WO_2008288_SUB_CLSCC.pdf.....	58
-------------------------------	----

Notes

Notes and Definitions.....	73
----------------------------	----



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2008288 Page 1 of 3

LABORATORIES, INC.				Chain of Custody Form	
Client: GED-LOGIC ASSOCIATES		Project #: 5020.1016		Page 1 of 1	
Attn: SARAH BATTLE		Project Name: LUTONWOOD		Comments:	
Street Address: 11415 N. BURNBURY ST #200		Sampler(s): V. WERNER		Analysis Requested	
City, State, Zip: SAN DIEGO, CA 92104		Phone: 619-451-1135 Fax: 619-451-1136		Sample Matrix	
Email: S>BATTLE@GED-LOGIC.COM		Work Order #: 2008288		Result Request **Surcharge	
Sample #	Description	Date Sampled	Time Sampled	Drinking Water	Other
-1	3-0.5	3/6/20	8:30	☒	☐
-2	3-1.5	3/6/20	8:35	☒	☐
-3	3-2.1	3/6/20	8:40	☒	☐
-4	3-2.6	3/6/20	8:45	☒	☐
-5	3-3.1	3/6/20	8:50	☒	☐
-6	3-3.6	3/6/20	8:55	☒	☐
-7	3-4.0	3/6/20	9:00	☒	☐
-8	1-0.5	3/6/20	11:30	☒	☐
-9	1-1.5	3/6/20	11:35	☒	☐
-10	1-1.1	3/6/20	11:40	☒	☐
-11	1-1.6	3/6/20	11:55	☒	☐
-12	1-2.1	3/6/20	12:00	☒	☐
-13	1-2.6	3/6/20	12:05	☒	☐

Analysis Requested	Drinking Water	Other	Notes
Drinking Water	☒	☐	
Ground Water	☐	☐	
Waste Water	☐	☐	
Sludge	☐	☐	
Soil	☐	☐	
APACHE	☒	☐	
TOTAL LEAD	☒	☐	
TOTAL ORGANIC CARBON	☒	☐	
ETHYLENE GLYCOL	☒	☐	
BENZENE, TOLUENE	☒	☐	
UNIDENTIFIED HYDROCARBONS	☒	☐	
ORGANIC PESTICIDES	☒	☐	

Global ID (Required for EDT)	EDF Required? Geotracker	EDF Required? State of CA? (EDT)	System # (Required for EDT)
1. Uniquified By: [Signature]	☐ Yes ☒ No	☐ Yes ☒ No	1. Received By: [Signature]
2. Relinquished By: [Signature]			2. Received By: [Signature]
3. Relinquished By: [Signature]			3. Received By: [Signature]

Date	Time	Date	Time	Date	Time
3/12/20	13:00	3/12/20	13:00	3/12/20	13:00

Check BY: DISTRIBUTION
SUB OUT

Client: _____
Address: _____
City: _____ State: _____ Zip: _____
Attn: _____
P.O. #: _____

BC Laboratories, Inc. - 4100 Atlas Ct. - Bakersfield, CA 93308 - 661.327.4911 - Fax: 661.327.1918 - www.bclabs.com

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2008288 Page 2 of 3

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 of 2							
Submission #: 20-08288											
SHIPPING INFORMATION		SHIPPING CONTAINER		FREE LIQUID							
Fed Ex ☐ UPS ☒ Ontrac ☐ Hand Delivery ☐ BC Lab Field Service ☐ Other ☐ (Specify) _____		Ice Chest ☒ None ☐ Box ☐ Other ☐ (Specify) _____		YES ☐ NO ☐ W / S							
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: NOT enough ice		Custody Seals: Ice Chest ☐ Containers ☐ None ☒ Comments: _____									
All samples received? Yes ☒ No ☐		All samples containers intact? Yes ☒ No ☐		Description(s) match COC? Yes ☒ No ☐							
COC Received YES ☒ NO ☐		Emissivity: .91 Container: Spill Shield Thermometer ID: 274 Temperature: (A) 13.3 °C / (C) 13.2 °C 3/17/15		Date/Time: 3-17-2015 Analyst Init: TK							
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES											
4oz / 8oz / 16oz PE UNPRES											
2oz Cr											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz											
PT CYANIDE											
PT NITROGEN FORMS											
PT TOTAL SULFIDE											
2oz NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON											
PT CHEMICAL OXYGEN DEMAND											
P/A PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL											
QT EPA 1664											
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40ml VOA VIAL 504											
QT EPA 505/508/509											
QT EPA 515.1/515											
QT EPA 525											
QT EPA 525 TRAVEL BLANK											
10ml EPA 547											
10ml EPA 531.1											
1oz EPA 548											
PT EPA 549											
PT EPA 5015M											
PT EPA 5270											
1oz / 16oz / 32oz AMBER											
1oz / 16oz / 32oz JAR											
OIL SLEEVE		AB	AB	AB	AB	A	AB	AB	A	A	A
CB VIAL											
LASTIC BAG											
EDLAR BAG											
ERROUS IRON											
NCORE											
ART KIT											
MMA CANISTER											
Comments:											
Sample Numbering Completed By: GSP		Date/Time: 3/17/15									
= Actual / C = Corrected		Rev 21 05/23/2016									
		C:\WPDoc\WordPerfect\BLAB_DOCS\08288\2008288\REC101									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2008288 Page 3 of 3

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 2 of 2							
Submission #: 2008288											
SHIPPING INFORMATION		SHIPPING CONTAINER		FREE LIQUID							
Fed Ex ☐ UPS ☒ Ontrac ☐ Hand Delivery ☐		Ice Chest ☒ None ☐ Box ☐		YES ☐ NO ☐							
BC Lab Field Service ☐ Other ☐ (Specify) _____		Other ☐ (Specify) _____		W / S							
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: NOT enough ice											
Custody Seals: Ice Chest ☐ Containers: ☐ None ☒ Comments:											
Intact? Yes ☐ No ☐		Intact? Yes ☐ No ☐									
All samples received? Yes ☐ No ☐		All samples containers intact? Yes ☐ No ☐		Description(s) match COC? Yes ☒ No ☐							
COC Received ☒ YES ☐ NO		Emissivity: 97 Container: 5011000		Thermometer ID: 274							
		Temperature: (A) 13.3 °C (C) 13.2 °C		Date/Time: 3-17-2015							
				Analyst Init: TK							
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES											
4oz / 8oz / 16oz PE UNPRES											
500 C ₁											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz											
T CYANIDE											
T NITROGEN FORMS											
T TOTAL SULFIDE											
oz. NITRATE / NITRITE											
T TOTAL ORGANIC CARBON											
T CHEMICAL OXYGEN DEMAND											
TA PHENOLICS											
0ml VOA VIAL TRAVEL BLANK											
0ml VOA VIAL											
T EPA 1664											
T ODOR											
ADIOLOGICAL											
ACTERIOLOGICAL											
1ml VOA-VIAL-504											
T EPA 505/508/510											
T EPA 515.1/515											
T EPA 525											
T EPA 525 TRAVEL BLANK											
ml EPA 547											
ml EPA 531.1											
E EPA 548											
E EPA 549											
E EPA 801SM											
E EPA 8270											
1 / 16oz / 32oz AMBER											
1 / 16oz / 32oz JAR											
IL SLEEVE		A	A	A							
B VIAL											
ASTIC BAG											
DLAR BAG											
RROUS IRON											
CORE											
ART KIT											
AMA CANISTER											
ments:											
ple Numbering Completed By: 658		Date/Time: 3/17/1443									
Actual / C = Corrected		Rev 21 05/23/2016									
		S:\WPDoc\WordPerfect\LAB_DOC\FORMS\SAMRECrev 201									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2008288-01	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 08:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-0.5	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-02	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 08:05
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-1.5	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-03	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 09:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-21	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-04	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 09:05
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-26	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-05	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 09:10
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-31	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-06	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 09:15
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-36	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-07	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 09:20
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	3-40	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2008288-08	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 11:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	1-0.5	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-09	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 11:35
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	1-1.5	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-10	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 11:50
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	1-11	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-11	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 11:55
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	1-16	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-12	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 12:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	1-21	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008288-13	COC Number:	---	Receive Date:	03/17/2020 12:15
	Project Number:	---	Sampling Date:	03/06/2020 12:05
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	1-26	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008288-01		Client Sample Name: 3-0.5, 3/6/2020 8:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.0025	0.000090	EPA-8081A	1.4	A01	1
alpha-BHC	ND	mg/kg	0.0025	0.00019	EPA-8081A		A01	1
beta-BHC	ND	mg/kg	0.0025	0.00024	EPA-8081A		A01	1
delta-BHC	ND	mg/kg	0.0025	0.00018	EPA-8081A		A01	1
gamma-BHC (Lindane)	ND	mg/kg	0.0025	0.000090	EPA-8081A	4.0	A01	1
Chlordane (Technical)	ND	mg/kg	0.25	0.0050	EPA-8081A	2.5	A01	1
4,4'-DDD	0.00037	mg/kg	0.0025	0.00032	EPA-8081A	1.0	J,A01	1
4,4'-DDE	0.0011	mg/kg	0.0025	0.00048	EPA-8081A	1.0	J,A01	1
4,4'-DDT	0.00076	mg/kg	0.0025	0.00020	EPA-8081A	1.0	J,A01	1
Dieldrin	ND	mg/kg	0.0025	0.00018	EPA-8081A	8.0	A01	1
Endosulfan I	ND	mg/kg	0.0025	0.00010	EPA-8081A		A01	1
Endosulfan II	ND	mg/kg	0.0025	0.00017	EPA-8081A		A01	1
Endosulfan sulfate	ND	mg/kg	0.0025	0.00013	EPA-8081A		A01	1
Endrin	ND	mg/kg	0.0025	0.00032	EPA-8081A	0.2	A01	1
Endrin aldehyde	ND	mg/kg	0.0025	0.000090	EPA-8081A		A01	1
Heptachlor	ND	mg/kg	0.0025	0.00043	EPA-8081A	4.7	A01	1
Heptachlor epoxide	ND	mg/kg	0.0025	0.000085	EPA-8081A		A01	1
Methoxychlor	ND	mg/kg	0.0025	0.00047	EPA-8081A	100	A01	1
Toxaphene	ND	mg/kg	0.25	0.0070	EPA-8081A	5	A01	1
TCMX (Surrogate)	39.1	%	20 - 130 (LCL - UCL)		EPA-8081A		A01	1
Decachlorobiphenyl (Surrogate)	34.8	%	40 - 130 (LCL - UCL)		EPA-8081A		A01,A20	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/20/20 10:30	03/20/20 21:19	HKS	GC-17	4.918	B073739	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID:	2008288-01	Client Sample Name:	3-0.5, 3/6/2020 8:00:00AM					
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	14.8	%	40 - 120 (LCL - UCL)		EPA-8151A		A20	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/20/20 09:30	03/25/20 06:14	OLH	GC-8	1.017	B073747	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-01		Client Sample Name: 3-0.5, 3/6/2020 8:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-01		Client Sample Name: 3-0.5, 3/6/2020 8:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	108	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	98.8	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	93.9	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-01		Client Sample Name: 3-0.5, 3/6/2020 8:00:00AM							
Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID		
1	EPA-8260B	03/17/20 10:20	03/18/20 19:28	BYM	MS-V2	1	B073253	EPA 5030 Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLIC)

BCL Sample ID: 2008288-01		Client Sample Name: 3-0.5, 3/6/2020 8:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Lead	6.7	mg/kg	2.5	0.28	EPA-6010B	1000		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-6010B	03/19/20 08:08	03/19/20 18:55		KDF	PE-OP4	1	B073477	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008288-02		Client Sample Name: 3-1.5, 3/6/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	0.00020	mg/kg	0.00050	0.000095	EPA-8081A	1.0	J	1
4,4'-DDT	0.00023	mg/kg	0.00050	0.000040	EPA-8081A	1.0	J	1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	26.1	%	20 - 130 (LCL - UCL)		EPA-8081A			1
Decachlorobiphenyl (Surrogate)	19.4	%	40 - 130 (LCL - UCL)		EPA-8081A		A20	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/20/20 10:30	03/20/20 21:35	HKS	GC-17	1.014	B073739	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID:	2008288-02	Client Sample Name:	3-1.5, 3/6/2020 8:05:00AM					
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	42.2	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/20/20 09:30	03/25/20 08:38	OLH	GC-8	0.993	B073747	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-02		Client Sample Name: 3-1.5, 3/6/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-02		Client Sample Name: 3-1.5, 3/6/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	108	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	97.3	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	97.6	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-02			Client Sample Name: 3-1.5, 3/6/2020 8:05:00AM							
Run		Run					QC			
Run #	Method	Prep Date	Date/Time	Analyst	Instrument	Dilution	Batch ID			
1	EPA-8260B	03/17/20 10:20	03/18/20 19:54	BYM	MS-V2	1	B073253	EPA 5030	Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLIC)

BCL Sample ID: 2008288-02		Client Sample Name: 3-1.5, 3/6/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Lead	3.4	mg/kg	2.5	0.28	EPA-6010B	1000		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-6010B	03/19/20 08:08	03/19/20 18:48		KDF	PE-OP4	1	B073477	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008288-03		Client Sample Name: 3-21, 3/6/2020 9:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	ND	mg/kg	0.00050	0.000095	EPA-8081A	1.0		1
4,4'-DDT	ND	mg/kg	0.00050	0.000040	EPA-8081A	1.0		1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	40.1	%	20 - 130 (LCL - UCL)		EPA-8081A			1
Decachlorobiphenyl (Surrogate)	46.2	%	40 - 130 (LCL - UCL)		EPA-8081A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/20/20 10:30	03/20/20 21:52	HKS	GC-17	1.010	B073739	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID: 2008288-03		Client Sample Name: 3-21, 3/6/2020 9:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	72.0	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/20/20 09:30	03/25/20 08:58	OLH	GC-8	1.017	B073747	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-03		Client Sample Name: 3-21, 3/6/2020 9:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-03		Client Sample Name: 3-21, 3/6/2020 9:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	109	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	100	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	95.9	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-03			Client Sample Name: 3-21, 3/6/2020 9:00:00AM												
Run #		Method		Prep Date		Run Date/Time		Analyst		Instrument		Dilution		QC Batch ID	
1		EPA-8260B		03/17/20 10:20		03/18/20 20:21		BYM		MS-V2		1		B073253 EPA 5030 Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008288-08		Client Sample Name: 1-0.5, 3/6/2020 11:30:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	ND	mg/kg	0.00050	0.000095	EPA-8081A	1.0		1
4,4'-DDT	0.00015	mg/kg	0.00050	0.000040	EPA-8081A	1.0	J	1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	15.9	%	20 - 130 (LCL - UCL)		EPA-8081A		A20	1
Decachlorobiphenyl (Surrogate)	11.8	%	40 - 130 (LCL - UCL)		EPA-8081A		A20	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/20/20 10:30	03/20/20 22:08	HKS	GC-17	0.990	B073739	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID:	2008288-08	Client Sample Name:	1-0.5, 3/6/2020 11:30:00AM					
Constituent	Result	Units	PQL	MDL	Method	TTLCLimits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	40.7	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/20/20 09:30	03/25/20 09:19	OLH	GC-8	1.007	B073747	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-08		Client Sample Name: 1-0.5, 3/6/2020 11:30:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-08		Client Sample Name: 1-0.5, 3/6/2020 11:30:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	112	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	99.1	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	88.3	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-08		Client Sample Name: 1-0.5, 3/6/2020 11:30:00AM							
Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID		
1	EPA-8260B	03/17/20 10:20	03/18/20 20:47	BYM	MS-V2	1	B073253	EPA 5030 Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLIC)

BCL Sample ID:	2008288-08	Client Sample Name:	1-0.5, 3/6/2020 11:30:00AM					
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Lead	4.2	mg/kg	2.5	0.28	EPA-6010B	1000		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-6010B	03/19/20 08:08	03/19/20 18:59	KDF	PE-OP4	0.909	B073477	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008288-09		Client Sample Name: 1-1.5, 3/6/2020 11:35:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	0.00039	mg/kg	0.00050	0.000095	EPA-8081A	1.0	J	1
4,4'-DDT	0.00058	mg/kg	0.00050	0.000040	EPA-8081A	1.0		1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	44.9	%	20 - 130 (LCL - UCL)		EPA-8081A			1
Decachlorobiphenyl (Surrogate)	48.4	%	40 - 130 (LCL - UCL)		EPA-8081A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/20/20 10:30	03/20/20 22:24	HKS	GC-17	1.010	B073739	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID:	2008288-09	Client Sample Name:	1-1.5, 3/6/2020 11:35:00AM					
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	67.2	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/20/20 09:30	03/25/20 09:39	OLH	GC-8	0.984	B073747	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-09		Client Sample Name: 1-1.5, 3/6/2020 11:35:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-09		Client Sample Name: 1-1.5, 3/6/2020 11:35:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	102	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	98.0	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	89.6	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-09		Client Sample Name: 1-1.5, 3/6/2020 11:35:00AM							
Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID		
1	EPA-8260B	03/18/20 10:00	03/19/20 16:54	BYM	MS-V2	1	B073304	EPA 5030 Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLIC)

BCL Sample ID:	2008288-09	Client Sample Name:	1-1.5, 3/6/2020 11:35:00AM					
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Lead	7.1	mg/kg	2.5	0.28	EPA-6010B	1000		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-6010B	03/19/20 08:08	03/19/20 19:00	KDF	PE-OP4	0.926	B073477	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008288-10		Client Sample Name: 1-11, 3/6/2020 11:50:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	ND	mg/kg	0.00050	0.000095	EPA-8081A	1.0		1
4,4'-DDT	ND	mg/kg	0.00050	0.000040	EPA-8081A	1.0		1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	22.4	%	20 - 130 (LCL - UCL)		EPA-8081A			1
Decachlorobiphenyl (Surrogate)	46.9	%	40 - 130 (LCL - UCL)		EPA-8081A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/20/20 10:30	03/20/20 22:41	HKS	GC-17	0.987	B073739	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID: 2008288-10		Client Sample Name: 1-11, 3/6/2020 11:50:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLCLimits	LabQuals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	56.0	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/20/20 09:30	03/25/20 10:00	OLH	GC-8	1.007	B073747	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-10		Client Sample Name: 1-11, 3/6/2020 11:50:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-10		Client Sample Name: 1-11, 3/6/2020 11:50:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	107	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	99.1	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	95.4	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008288-10			Client Sample Name: 1-11, 3/6/2020 11:50:00AM							
Run		Run						QC		
Run #	Method	Prep Date		Date/Time		Analyst	Instrument	Dilution	Batch ID	
1	EPA-8260B	03/18/20	10:00	03/19/20	17:20	BYM	MS-V2	1	B073304 EPA 5030 Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073739						
Aldrin	B073739-BLK1	ND	mg/kg	0.00050	0.000018	
alpha-BHC	B073739-BLK1	ND	mg/kg	0.00050	0.000038	
beta-BHC	B073739-BLK1	ND	mg/kg	0.00050	0.000048	
delta-BHC	B073739-BLK1	ND	mg/kg	0.00050	0.000037	
gamma-BHC (Lindane)	B073739-BLK1	ND	mg/kg	0.00050	0.000018	
Chlordane (Technical)	B073739-BLK1	ND	mg/kg	0.050	0.0010	
4,4'-DDD	B073739-BLK1	ND	mg/kg	0.00050	0.000064	
4,4'-DDE	B073739-BLK1	ND	mg/kg	0.00050	0.000095	
4,4'-DDT	B073739-BLK1	ND	mg/kg	0.00050	0.000040	
Dieldrin	B073739-BLK1	ND	mg/kg	0.00050	0.000036	
Endosulfan I	B073739-BLK1	ND	mg/kg	0.00050	0.000020	
Endosulfan II	B073739-BLK1	ND	mg/kg	0.00050	0.000034	
Endosulfan sulfate	B073739-BLK1	ND	mg/kg	0.00050	0.000026	
Endrin	B073739-BLK1	ND	mg/kg	0.00050	0.000065	
Endrin aldehyde	B073739-BLK1	ND	mg/kg	0.00050	0.000018	
Heptachlor	B073739-BLK1	ND	mg/kg	0.00050	0.000086	
Heptachlor epoxide	B073739-BLK1	ND	mg/kg	0.00050	0.000017	
Methoxychlor	B073739-BLK1	ND	mg/kg	0.00050	0.000094	
Toxaphene	B073739-BLK1	ND	mg/kg	0.050	0.0014	
TCMX (Surrogate)	B073739-BLK1	99.8	%	20 - 130 (LCL - UCL)		
Decachlorobiphenyl (Surrogate)	B073739-BLK1	101	%	40 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B073739										
Aldrin	B073739-BS1	LCS	0.0056663	0.0049505	mg/kg	114		70 - 130		
gamma-BHC (Lindane)	B073739-BS1	LCS	0.0054172	0.0049505	mg/kg	109		60 - 140		
4,4'-DDT	B073739-BS1	LCS	0.0069046	0.0049505	mg/kg	139		60 - 140		
Dieldrin	B073739-BS1	LCS	0.0056531	0.0049505	mg/kg	114		70 - 130		
Endrin	B073739-BS1	LCS	0.0059363	0.0049505	mg/kg	120		60 - 140		
Heptachlor	B073739-BS1	LCS	0.0055894	0.0049505	mg/kg	113		60 - 140		
TCMX (Surrogate)	B073739-BS1	LCS	0.010271	0.0099010	mg/kg	104		20 - 130		
Decachlorobiphenyl (Surrogate)	B073739-BS1	LCS	0.021476	0.019802	mg/kg	108		40 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073739		Used client sample: N									
Aldrin	MS	2005481-79	ND	0.0057186	0.0050676	mg/kg		113		50 - 140	
	MSD	2005481-79	ND	0.0057832	0.0050505	mg/kg	1.1	115	30	50 - 140	
gamma-BHC (Lindane)	MS	2005481-79	ND	0.0054480	0.0050676	mg/kg		108		50 - 140	
	MSD	2005481-79	ND	0.0054498	0.0050505	mg/kg	0.0	108	30	50 - 140	
4,4'-DDT	MS	2005481-79	ND	0.0070611	0.0050676	mg/kg		139		50 - 140	
	MSD	2005481-79	ND	0.0071111	0.0050505	mg/kg	0.7	141	30	50 - 140	Q03
Dieldrin	MS	2005481-79	ND	0.0057902	0.0050676	mg/kg		114		40 - 140	
	MSD	2005481-79	ND	0.0058229	0.0050505	mg/kg	0.6	115	30	40 - 140	
Endrin	MS	2005481-79	ND	0.0060422	0.0050676	mg/kg		119		50 - 150	
	MSD	2005481-79	ND	0.0059178	0.0050505	mg/kg	2.1	117	30	50 - 150	
Heptachlor	MS	2005481-79	ND	0.0057905	0.0050676	mg/kg		114		60 - 140	
	MSD	2005481-79	ND	0.0056943	0.0050505	mg/kg	1.7	113	30	60 - 140	
TCMX (Surrogate)	MS	2005481-79	ND	0.0096405	0.010135	mg/kg		95.1		20 - 130	
	MSD	2005481-79	ND	0.0096438	0.010101	mg/kg	0.0	95.5		20 - 130	
Decachlorobiphenyl (Surrogate)	MS	2005481-79	ND	0.021968	0.020270	mg/kg		108		40 - 130	
	MSD	2005481-79	ND	0.022023	0.020202	mg/kg	0.2	109		40 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073747						
2,4-D	B073747-BLK1	ND	mg/kg	0.020	0.0030	
2,4-DB	B073747-BLK1	ND	mg/kg	0.040	0.0067	
Dalapon	B073747-BLK1	ND	mg/kg	0.050	0.0068	
Dicamba	B073747-BLK1	ND	mg/kg	0.0020	0.00057	
Dichloroprop	B073747-BLK1	ND	mg/kg	0.020	0.0037	
Dinoseb	B073747-BLK1	ND	mg/kg	0.0070	0.0020	
2,4,5-T	B073747-BLK1	ND	mg/kg	0.0030	0.0011	
2,4,5-TP (Silvex)	B073747-BLK1	ND	mg/kg	0.0030	0.00073	
2,4-Dichlorophenylacetic acid (Surrogate)	B073747-BLK1	72.5	%	40 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B073747										
2,4-D	B073747-BS1	LCS	0.070432	0.079734	mg/kg	88.3		50 - 120		
2,4-DB	B073747-BS1	LCS	0.16312	0.17940	mg/kg	90.9		50 - 120		
Dicamba	B073747-BS1	LCS	0.014618	0.019934	mg/kg	73.3		50 - 120		
Dichloroprop	B073747-BS1	LCS	0.061462	0.079734	mg/kg	77.1		50 - 120		
Dinoseb	B073747-BS1	LCS	0.027575	0.039867	mg/kg	69.2		50 - 120		
2,4,5-T	B073747-BS1	LCS	0.018937	0.019934	mg/kg	95.0		30 - 120		
2,4,5-TP (Silvex)	B073747-BS1	LCS	0.018272	0.019934	mg/kg	91.7		50 - 120		
2,4-Dichlorophenylacetic acid (Surrogate)	B073747-BS1	LCS	0.093023	0.13289	mg/kg	70.0		40 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: B073747		Used client sample: N									
2,4-D	MS	2005481-75	ND	0.079672	0.078689	mg/kg		101		40 - 120	
	MSD	2005481-75	ND	0.067333	0.080000	mg/kg	16.8	84.2	30	40 - 120	
2,4-DB	MS	2005481-75	ND	0.16230	0.17705	mg/kg		91.7		50 - 120	
	MSD	2005481-75	ND	0.16867	0.18000	mg/kg	3.9	93.7	30	50 - 120	
Dicamba	MS	2005481-75	ND	0.016393	0.019672	mg/kg		83.3		50 - 120	
	MSD	2005481-75	ND	0.014333	0.020000	mg/kg	13.4	71.7	30	50 - 120	
Dichloroprop	MS	2005481-75	ND	0.069836	0.078689	mg/kg		88.8		40 - 120	
	MSD	2005481-75	ND	0.059333	0.080000	mg/kg	16.3	74.2	30	40 - 120	
Dinoseb	MS	2005481-75	ND	0.027869	0.039344	mg/kg		70.8		40 - 130	
	MSD	2005481-75	ND	0.026667	0.040000	mg/kg	4.4	66.7	30	40 - 130	
2,4,5-T	MS	2005481-75	ND	0.019344	0.019672	mg/kg		98.3		30 - 120	
	MSD	2005481-75	ND	0.019333	0.020000	mg/kg	0.1	96.7	30	30 - 120	
2,4,5-TP (Silvex)	MS	2005481-75	ND	0.018689	0.019672	mg/kg		95.0		40 - 120	
	MSD	2005481-75	ND	0.019667	0.020000	mg/kg	5.1	98.3	30	40 - 120	
2,4-Dichlorophenylacetic acid (Surrogate)	MS	2005481-75	ND	0.10721	0.13115	mg/kg		81.7		40 - 120	
	MSD	2005481-75	ND	0.095667	0.13333	mg/kg	11.4	71.8		40 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073253						
Benzene	B073253-BLK1	ND	mg/kg	0.0050	0.0018	
Bromobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
Bromochloromethane	B073253-BLK1	ND	mg/kg	0.0050	0.0014	
Bromodichloromethane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
Bromoform	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
Bromomethane	B073253-BLK1	ND	mg/kg	0.0050	0.0024	
n-Butylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
sec-Butylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
tert-Butylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0024	
Carbon tetrachloride	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
Chlorobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
Chloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
Chloroform	B073253-BLK1	ND	mg/kg	0.0050	0.0017	
Chloromethane	B073253-BLK1	ND	mg/kg	0.0050	0.0017	
2-Chlorotoluene	B073253-BLK1	ND	mg/kg	0.0050	0.0018	
4-Chlorotoluene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
Dibromochloromethane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,2-Dibromo-3-chloropropane	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
1,2-Dibromoethane	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
Dibromomethane	B073253-BLK1	ND	mg/kg	0.0050	0.0016	
1,2-Dichlorobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
1,3-Dichlorobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,4-Dichlorobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
Dichlorodifluoromethane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,1-Dichloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
1,2-Dichloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0017	
1,1-Dichloroethene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
cis-1,2-Dichloroethene	B073253-BLK1	ND	mg/kg	0.0050	0.0018	
trans-1,2-Dichloroethene	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
1,2-Dichloropropane	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
1,3-Dichloropropane	B073253-BLK1	ND	mg/kg	0.0050	0.0022	
2,2-Dichloropropane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,1-Dichloropropene	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
cis-1,3-Dichloropropene	B073253-BLK1	ND	mg/kg	0.0050	0.0017	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073253						
trans-1,3-Dichloropropene	B073253-BLK1	ND	mg/kg	0.0050	0.0018	
Ethylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0022	
Hexachlorobutadiene	B073253-BLK1	ND	mg/kg	0.0050	0.0031	
Isopropylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
p-Isopropyltoluene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
Methylene chloride	B073253-BLK1	ND	mg/kg	0.010	0.0015	
Methyl t-butyl ether	B073253-BLK1	ND	mg/kg	0.0050	0.0017	
Naphthalene	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
n-Propylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
Styrene	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,1,2-Tetrachloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,2,2-Tetrachloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0022	
Tetrachloroethene	B073253-BLK1	ND	mg/kg	0.0050	0.0022	
Toluene	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,2,3-Trichlorobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0026	
1,2,4-Trichlorobenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0027	
1,1,1-Trichloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,2-Trichloroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
Trichloroethene	B073253-BLK1	ND	mg/kg	0.0050	0.0022	
Trichlorofluoromethane	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
1,2,3-Trichloropropane	B073253-BLK1	ND	mg/kg	0.0050	0.0023	
1,1,2-Trichloro-1,2,2-trifluoroethane	B073253-BLK1	ND	mg/kg	0.0050	0.0020	
1,2,4-Trimethylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
1,3,5-Trimethylbenzene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
Vinyl chloride	B073253-BLK1	ND	mg/kg	0.0050	0.0019	
Total Xylenes	B073253-BLK1	ND	mg/kg	0.010	0.0034	
p- & m-Xylenes	B073253-BLK1	ND	mg/kg	0.0050	0.0038	
o-Xylene	B073253-BLK1	ND	mg/kg	0.0050	0.0021	
1,2-Dichloroethane-d4 (Surrogate)	B073253-BLK1	96.6	%	70 - 121 (LCL - UCL)		
Toluene-d8 (Surrogate)	B073253-BLK1	96.5	%	81 - 117 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	B073253-BLK1	91.1	%	74 - 121 (LCL - UCL)		
QC Batch ID: B073304						
Benzene	B073304-BLK1	ND	mg/kg	0.0050	0.0018	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073304						
Bromobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
Bromochloromethane	B073304-BLK1	ND	mg/kg	0.0050	0.0014	
Bromodichloromethane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
Bromoform	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
Bromomethane	B073304-BLK1	ND	mg/kg	0.0050	0.0024	
n-Butylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
sec-Butylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
tert-Butylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0024	
Carbon tetrachloride	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
Chlorobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
Chloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
Chloroform	B073304-BLK1	ND	mg/kg	0.0050	0.0017	
Chloromethane	B073304-BLK1	ND	mg/kg	0.0050	0.0017	
2-Chlorotoluene	B073304-BLK1	ND	mg/kg	0.0050	0.0018	
4-Chlorotoluene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
Dibromochloromethane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,2-Dibromo-3-chloropropane	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
1,2-Dibromoethane	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
Dibromomethane	B073304-BLK1	ND	mg/kg	0.0050	0.0016	
1,2-Dichlorobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
1,3-Dichlorobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,4-Dichlorobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
Dichlorodifluoromethane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,1-Dichloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
1,2-Dichloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0017	
1,1-Dichloroethene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
cis-1,2-Dichloroethene	B073304-BLK1	ND	mg/kg	0.0050	0.0018	
trans-1,2-Dichloroethene	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
1,2-Dichloropropane	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
1,3-Dichloropropane	B073304-BLK1	ND	mg/kg	0.0050	0.0022	
2,2-Dichloropropane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,1-Dichloropropene	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
cis-1,3-Dichloropropene	B073304-BLK1	ND	mg/kg	0.0050	0.0017	
trans-1,3-Dichloropropene	B073304-BLK1	ND	mg/kg	0.0050	0.0018	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073304						
Ethylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0022	
Hexachlorobutadiene	B073304-BLK1	ND	mg/kg	0.0050	0.0031	
Isopropylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
p-Isopropyltoluene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
Methylene chloride	B073304-BLK1	ND	mg/kg	0.010	0.0015	
Methyl t-butyl ether	B073304-BLK1	ND	mg/kg	0.0050	0.0017	
Naphthalene	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
n-Propylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
Styrene	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,1,2-Tetrachloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,2,2-Tetrachloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0022	
Tetrachloroethene	B073304-BLK1	ND	mg/kg	0.0050	0.0022	
Toluene	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,2,3-Trichlorobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0026	
1,2,4-Trichlorobenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0027	
1,1,1-Trichloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,2-Trichloroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
Trichloroethene	B073304-BLK1	ND	mg/kg	0.0050	0.0022	
Trichlorofluoromethane	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
1,2,3-Trichloropropane	B073304-BLK1	ND	mg/kg	0.0050	0.0023	
1,1,2-Trichloro-1,2,2-trifluoroethane	B073304-BLK1	ND	mg/kg	0.0050	0.0020	
1,2,4-Trimethylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
1,3,5-Trimethylbenzene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
Vinyl chloride	B073304-BLK1	ND	mg/kg	0.0050	0.0019	
Total Xylenes	B073304-BLK1	ND	mg/kg	0.010	0.0034	
p- & m-Xylenes	B073304-BLK1	ND	mg/kg	0.0050	0.0038	
o-Xylene	B073304-BLK1	ND	mg/kg	0.0050	0.0021	
1,2-Dichloroethane-d4 (Surrogate)	B073304-BLK1	96.9	%	70 - 121 (LCL - UCL)		
Toluene-d8 (Surrogate)	B073304-BLK1	99.3	%	81 - 117 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	B073304-BLK1	91.8	%	74 - 121 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B073253										
Benzene	B073253-BS1	LCS	0.12641	0.12500	mg/kg	101		70 - 130		
Bromodichloromethane	B073253-BS1	LCS	0.11595	0.12500	mg/kg	92.8		70 - 130		
Chlorobenzene	B073253-BS1	LCS	0.12029	0.12500	mg/kg	96.2		70 - 130		
Chloroethane	B073253-BS1	LCS	0.14037	0.12500	mg/kg	112		70 - 130		
1,4-Dichlorobenzene	B073253-BS1	LCS	0.11665	0.12500	mg/kg	93.3		70 - 130		
1,1-Dichloroethane	B073253-BS1	LCS	0.11689	0.12500	mg/kg	93.5		70 - 130		
1,1-Dichloroethene	B073253-BS1	LCS	0.11310	0.12500	mg/kg	90.5		70 - 130		
Toluene	B073253-BS1	LCS	0.11550	0.12500	mg/kg	92.4		70 - 130		
Trichloroethene	B073253-BS1	LCS	0.10899	0.12500	mg/kg	87.2		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B073253-BS1	LCS	0.048670	0.050000	mg/kg	97.3		70 - 121		
Toluene-d8 (Surrogate)	B073253-BS1	LCS	0.047950	0.050000	mg/kg	95.9		81 - 117		
4-Bromofluorobenzene (Surrogate)	B073253-BS1	LCS	0.048260	0.050000	mg/kg	96.5		74 - 121		
QC Batch ID: B073304										
Benzene	B073304-BS1	LCS	0.12753	0.12500	mg/kg	102		70 - 130		
Bromodichloromethane	B073304-BS1	LCS	0.11804	0.12500	mg/kg	94.4		70 - 130		
Chlorobenzene	B073304-BS1	LCS	0.11837	0.12500	mg/kg	94.7		70 - 130		
Chloroethane	B073304-BS1	LCS	0.14536	0.12500	mg/kg	116		70 - 130		
1,4-Dichlorobenzene	B073304-BS1	LCS	0.11361	0.12500	mg/kg	90.9		70 - 130		
1,1-Dichloroethane	B073304-BS1	LCS	0.11961	0.12500	mg/kg	95.7		70 - 130		
1,1-Dichloroethene	B073304-BS1	LCS	0.11293	0.12500	mg/kg	90.3		70 - 130		
Toluene	B073304-BS1	LCS	0.11691	0.12500	mg/kg	93.5		70 - 130		
Trichloroethene	B073304-BS1	LCS	0.11036	0.12500	mg/kg	88.3		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B073304-BS1	LCS	0.047670	0.050000	mg/kg	95.3		70 - 121		
Toluene-d8 (Surrogate)	B073304-BS1	LCS	0.048830	0.050000	mg/kg	97.7		81 - 117		
4-Bromofluorobenzene (Surrogate)	B073304-BS1	LCS	0.046700	0.050000	mg/kg	93.4		74 - 121		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab
QC Batch ID: B073253		Used client sample: N									
Benzene	MS	2005481-67	ND	0.13928	0.12500	mg/kg		111		70 - 130	
	MSD	2005481-67	ND	0.13749	0.12500	mg/kg	1.3	110	20	70 - 130	
Bromodichloromethane	MS	2005481-67	ND	0.13209	0.12500	mg/kg		106		70 - 130	
	MSD	2005481-67	ND	0.13126	0.12500	mg/kg	0.6	105	20	70 - 130	
Chlorobenzene	MS	2005481-67	ND	0.13270	0.12500	mg/kg		106		70 - 130	
	MSD	2005481-67	ND	0.13217	0.12500	mg/kg	0.4	106	20	70 - 130	
Chloroethane	MS	2005481-67	ND	0.11631	0.12500	mg/kg		93.0		70 - 130	
	MSD	2005481-67	ND	0.16271	0.12500	mg/kg	33.3	130	20	70 - 130	Q02
1,4-Dichlorobenzene	MS	2005481-67	ND	0.12897	0.12500	mg/kg		103		70 - 130	
	MSD	2005481-67	ND	0.12349	0.12500	mg/kg	4.3	98.8	20	70 - 130	
1,1-Dichloroethane	MS	2005481-67	ND	0.13150	0.12500	mg/kg		105		70 - 130	
	MSD	2005481-67	ND	0.13033	0.12500	mg/kg	0.9	104	20	70 - 130	
1,1-Dichloroethene	MS	2005481-67	ND	0.12613	0.12500	mg/kg		101		70 - 130	
	MSD	2005481-67	ND	0.12477	0.12500	mg/kg	1.1	99.8	20	70 - 130	
Toluene	MS	2005481-67	ND	0.13486	0.12500	mg/kg		108		70 - 130	
	MSD	2005481-67	ND	0.13196	0.12500	mg/kg	2.2	106	20	70 - 130	
Trichloroethene	MS	2005481-67	ND	0.12977	0.12500	mg/kg		104		70 - 130	
	MSD	2005481-67	ND	0.12676	0.12500	mg/kg	2.3	101	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	2005481-67	ND	0.049450	0.050000	mg/kg		98.9		70 - 121	
	MSD	2005481-67	ND	0.048020	0.050000	mg/kg	2.9	96.0		70 - 121	
Toluene-d8 (Surrogate)	MS	2005481-67	ND	0.050680	0.050000	mg/kg		101		81 - 117	
	MSD	2005481-67	ND	0.048830	0.050000	mg/kg	3.7	97.7		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	2005481-67	ND	0.048400	0.050000	mg/kg		96.8		74 - 121	
	MSD	2005481-67	ND	0.047040	0.050000	mg/kg	2.8	94.1		74 - 121	
QC Batch ID: B073304		Used client sample: N									
Benzene	MS	2005481-69	ND	0.13884	0.12500	mg/kg		111		70 - 130	
	MSD	2005481-69	ND	0.13341	0.12500	mg/kg	4.0	107	20	70 - 130	
Bromodichloromethane	MS	2005481-69	ND	0.12672	0.12500	mg/kg		101		70 - 130	
	MSD	2005481-69	ND	0.13020	0.12500	mg/kg	2.7	104	20	70 - 130	
Chlorobenzene	MS	2005481-69	ND	0.12717	0.12500	mg/kg		102		70 - 130	
	MSD	2005481-69	ND	0.12738	0.12500	mg/kg	0.2	102	20	70 - 130	
Chloroethane	MS	2005481-69	ND	0.12534	0.12500	mg/kg		100		70 - 130	
	MSD	2005481-69	ND	0.11968	0.12500	mg/kg	4.6	95.7	20	70 - 130	
1,4-Dichlorobenzene	MS	2005481-69	ND	0.11993	0.12500	mg/kg		95.9		70 - 130	
	MSD	2005481-69	ND	0.11773	0.12500	mg/kg	1.9	94.2	20	70 - 130	
1,1-Dichloroethane	MS	2005481-69	ND	0.13056	0.12500	mg/kg		104		70 - 130	
	MSD	2005481-69	ND	0.12634	0.12500	mg/kg	3.3	101	20	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073304		Used client sample: N									
1,1-Dichloroethene	MS	2005481-69	ND	0.12293	0.12500	mg/kg		98.3		70 - 130	
	MSD	2005481-69	ND	0.11572	0.12500	mg/kg	6.0	92.6	20	70 - 130	
Toluene	MS	2005481-69	ND	0.12753	0.12500	mg/kg		102		70 - 130	
	MSD	2005481-69	ND	0.12661	0.12500	mg/kg	0.7	101	20	70 - 130	
Trichloroethene	MS	2005481-69	ND	0.11979	0.12500	mg/kg		95.8		70 - 130	
	MSD	2005481-69	ND	0.12041	0.12500	mg/kg	0.5	96.3	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	2005481-69	ND	0.049830	0.050000	mg/kg		99.7		70 - 121	
	MSD	2005481-69	ND	0.046810	0.050000	mg/kg	6.2	93.6		70 - 121	
Toluene-d8 (Surrogate)	MS	2005481-69	ND	0.049300	0.050000	mg/kg		98.6		81 - 117	
	MSD	2005481-69	ND	0.049510	0.050000	mg/kg	0.4	99.0		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	2005481-69	ND	0.047630	0.050000	mg/kg		95.3		74 - 121	
	MSD	2005481-69	ND	0.047110	0.050000	mg/kg	1.1	94.2		74 - 121	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073477						
Lead	B073477-BLK1	ND	mg/kg	2.5	0.28	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Laboratory Control Sample

								Control Limits		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab Quals
QC Batch ID: B073477										
	Lead	B073477-BS1	LCS	102.88	100.00	mg/kg	103		75 - 125	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		
									RPD	Percent Recovery	Lab Quals
QC Batch ID: B073477		Used client sample: Y - Description: 3-1.5, 03/06/2020 08:05									
Lead	DUP	2008288-02	3.3689	2.8969		mg/kg	15.1		20		
	MS	2008288-02	3.3689	91.443	100.00	mg/kg		88.1		75 - 125	
	MSD	2008288-02	3.3689	89.746	100.00	mg/kg	1.9	86.4	20	75 - 125	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



eurofins

Environment Testing
America

ANALYTICAL REPORT

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Tel: (714)895-5494

Laboratory Job ID: 570-27008-1
Client Project/Site: 2008288

For:
BC Laboratories
4100 Atlas Court
Bakersfield, California 93308

Attn: Natalie Serda

Authorized for release by:
5/4/2020 6:53:03 PM

Terri Chang, Project Manager I
(714)895-5494
terrichang@eurofinsus.com

LINKS

Review your project
results through
TotalAccess

Have a Question?

? Ask
The
Expert

Visit us at:
www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAP and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1
2
3
4
5
6
7
8
9
10
11
12
13
14



Client: BC Laboratories
Project/Site: 2008288

Laboratory Job ID: 570-27008-1

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Detection Summary	5
Client Sample Results	6
QC Sample Results	7
QC Association Summary	8
Lab Chronicle	9
Certification Summary	11
Method Summary	12
Sample Summary	13
Chain of Custody	14
Receipt Checklists	15

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**Definitions/Glossary**Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Qualifiers**General Chemistry****Qualifier** **Qualifier Description**

H	Sample was prepped or analyzed beyond the specified holding time
H3	Sample was received and analyzed past holding time.

Glossary**Abbreviation** **These commonly used abbreviations may or may not be present in this report.**

"	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Eurofins Calscience LLC

Page 3 of 15

5/4/2020

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Case Narrative

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Job ID: 570-27008-1

Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative
570-27008-1

Comments

No additional comments.

Receipt

The samples were received on 4/30/2020 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9° C.

General Chemistry

Method 9060A: The following samples were received outside of holding time: 2008288-01 (570-27008-1), 2008288-02 (570-27008-2), 2008288-03 (570-27008-3), 2008288-08 (570-27008-4), 2008288-09 (570-27008-5) and 2008288-10 (570-27008-6).

Method Moisture: The following samples were received outside of holding time: 2008288-01 (570-27008-1), 2008288-02 (570-27008-2), 2008288-03 (570-27008-3), 2008288-08 (570-27008-4), 2008288-09 (570-27008-5) and 2008288-10 (570-27008-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**Detection Summary**Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Client Sample ID: 2008288-01**Lab Sample ID: 570-27008-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	5190	H H3	585	mg/Kg	1	☒	9060A	Total/NA

Client Sample ID: 2008288-02**Lab Sample ID: 570-27008-2**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	3050	H H3	580	mg/Kg	1	☒	9060A	Total/NA

Client Sample ID: 2008288-03**Lab Sample ID: 570-27008-3**

No Detections.

Client Sample ID: 2008288-08**Lab Sample ID: 570-27008-4**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	8020	H H3	606	mg/Kg	1	☒	9060A	Total/NA

Client Sample ID: 2008288-09**Lab Sample ID: 570-27008-5**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	2000	H H3	607	mg/Kg	1	☒	9060A	Total/NA

Client Sample ID: 2008288-10**Lab Sample ID: 570-27008-6**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	1300	H H3	606	mg/Kg	1	☒	9060A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

**Client Sample Results**Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

General ChemistryClient Sample ID: 2008288-01
Date Collected: 03/06/20 08:00
Date Received: 04/30/20 10:30Lab Sample ID: 570-27008-1
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	5190	H H3	585	mg/Kg	☐		05/01/20 17:00	1
Percent Moisture	14.5	H H3	0.1	%			04/30/20 11:10	1

Client Sample ID: 2008288-02
Date Collected: 03/06/20 08:05
Date Received: 04/30/20 10:30Lab Sample ID: 570-27008-2
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	3050	H H3	580	mg/Kg	☐		05/01/20 17:00	1
Percent Moisture	13.8	H H3	0.1	%			04/30/20 11:10	1

Client Sample ID: 2008288-03
Date Collected: 03/06/20 09:00
Date Received: 04/30/20 10:30Lab Sample ID: 570-27008-3
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	ND	H H3	585	mg/Kg	☐		05/01/20 17:00	1
Percent Moisture	11.5	H H3	0.1	%			04/30/20 11:10	1

Client Sample ID: 2008288-08
Date Collected: 03/06/20 11:30
Date Received: 04/30/20 10:30Lab Sample ID: 570-27008-4
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	8020	H H3	606	mg/Kg	☐		05/01/20 17:00	1
Percent Moisture	17.5	H H3	0.1	%			04/30/20 11:10	1

Client Sample ID: 2008288-09
Date Collected: 03/06/20 11:35
Date Received: 04/30/20 10:30Lab Sample ID: 570-27008-5
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	2000	H H3	607	mg/Kg	☐		05/01/20 17:00	1
Percent Moisture	17.6	H H3	0.1	%			04/30/20 11:10	1

Client Sample ID: 2008288-10
Date Collected: 03/06/20 11:50
Date Received: 04/30/20 10:30Lab Sample ID: 570-27008-6
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	1300	H H3	606	mg/Kg	☐		05/01/20 17:00	1
Percent Moisture	17.5	H H3	0.1	%			04/30/20 11:10	1

Eurofins Calscience LLC

QC Sample Results

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 570-66919/4
Matrix: Solid
Analysis Batch: 66919

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	ND		500	mg/Kg			05/01/20 17:00	1

Lab Sample ID: LCS 570-66919/5
Matrix: Solid
Analysis Batch: 66919

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon, Total Organic	29900	29340		mg/Kg		98	80 - 120

Lab Sample ID: LCSD 570-66919/6
Matrix: Solid
Analysis Batch: 66919

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon, Total Organic	30000	27980		mg/Kg		93	80 - 120	5	20

Lab Sample ID: 570-25872-A-8-B MS
Matrix: Solid
Analysis Batch: 66919

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon, Total Organic	2190		36100	35820		mg/Kg	⊗	93	75 - 125

Lab Sample ID: 570-25872-A-8-C MSD
Matrix: Solid
Analysis Batch: 66919

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon, Total Organic	2190		36400	36450		mg/Kg	⊗	100	75 - 125	7	25

Method: Moisture - Percent Moisture

Lab Sample ID: 570-27008-1 DU
Matrix: Solid
Analysis Batch: 66254

Client Sample ID: 2008288-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	14.5	H H3	14.9		%		3	10

Eurofins Calscience LLC

QC Association Summary

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

General Chemistry

Cleanup Batch: 63844

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-25872-A-8-B MS	Matrix Spike	Total/NA	Solid	Homogenize	
570-25872-A-8-C MSD	Matrix Spike Duplicate	Total/NA	Solid	Prep Homogenize Prep	

Analysis Batch: 66254

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-27008-1	2008288-01	Total/NA	Solid	Moisture	
570-27008-2	2008288-02	Total/NA	Solid	Moisture	
570-27008-3	2008288-03	Total/NA	Solid	Moisture	
570-27008-4	2008288-08	Total/NA	Solid	Moisture	
570-27008-5	2008288-09	Total/NA	Solid	Moisture	
570-27008-6	2008288-10	Total/NA	Solid	Moisture	
570-27008-1 DU	2008288-01	Total/NA	Solid	Moisture	

Analysis Batch: 66919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-27008-1	2008288-01	Total/NA	Solid	9060A	
570-27008-2	2008288-02	Total/NA	Solid	9060A	
570-27008-3	2008288-03	Total/NA	Solid	9060A	
570-27008-4	2008288-08	Total/NA	Solid	9060A	
570-27008-5	2008288-09	Total/NA	Solid	9060A	
570-27008-6	2008288-10	Total/NA	Solid	9060A	
MB 570-66919/4	Method Blank	Total/NA	Solid	9060A	
LCS 570-66919/5	Lab Control Sample	Total/NA	Solid	9060A	
LCSD 570-66919/6	Lab Control Sample Dup	Total/NA	Solid	9060A	
570-25872-A-8-B MS	Matrix Spike	Total/NA	Solid	9060A	63844
570-25872-A-8-C MSD	Matrix Spike Duplicate	Total/NA	Solid	9060A	63844

Eurofins Calscience LLC

**Lab Chronicle**Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Client Sample ID: 2008288-01**Lab Sample ID: 570-27008-1****Date Collected: 03/06/20 08:00****Matrix: Solid****Date Received: 04/30/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	207.8 mg	207.8 mg	66919	05/01/20 17:00	UAPD	ECL 1
Instrument ID: TOC10										
Total/NA	Analysis	Moisture		1			66254	04/30/20 11:10	YR9U	ECL 2
Instrument ID: NOEQUIP										

Client Sample ID: 2008288-02**Lab Sample ID: 570-27008-2****Date Collected: 03/06/20 08:05****Matrix: Solid****Date Received: 04/30/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	208.9 mg	208.9 mg	66919	05/01/20 17:00	UAPD	ECL 1
Instrument ID: TOC10										
Total/NA	Analysis	Moisture		1			66254	04/30/20 11:10	YR9U	ECL 2
Instrument ID: NOEQUIP										

Client Sample ID: 2008288-03**Lab Sample ID: 570-27008-3****Date Collected: 03/06/20 09:00****Matrix: Solid****Date Received: 04/30/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	207.5 mg	207.5 mg	66919	05/01/20 17:00	UAPD	ECL 1
Instrument ID: TOC10										
Total/NA	Analysis	Moisture		1			66254	04/30/20 11:10	YR9U	ECL 2
Instrument ID: NOEQUIP										

Client Sample ID: 2008288-08**Lab Sample ID: 570-27008-4****Date Collected: 03/06/20 11:30****Matrix: Solid****Date Received: 04/30/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	207.7 mg	207.7 mg	66919	05/01/20 17:00	UAPD	ECL 1
Instrument ID: TOC10										
Total/NA	Analysis	Moisture		1			66254	04/30/20 11:10	YR9U	ECL 2
Instrument ID: NOEQUIP										

Client Sample ID: 2008288-09**Lab Sample ID: 570-27008-5****Date Collected: 03/06/20 11:35****Matrix: Solid****Date Received: 04/30/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	209.6 mg	209.6 mg	66919	05/01/20 17:00	UAPD	ECL 1
Instrument ID: TOC10										
Total/NA	Analysis	Moisture		1			66254	04/30/20 11:10	YR9U	ECL 2
Instrument ID: NOEQUIP										

Eurofins Calscience LLC



Lab Chronicle

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Client Sample ID: 2008288-10

Lab Sample ID: 570-27008-6

Date Collected: 03/06/20 11:50

Matrix: Solid

Date Received: 04/30/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	207.9 mg	207.9 mg	66919	05/01/20 17:00	UAPD	ECL 1
		Instrument ID: TOC10								
Total/NA	Analysis	Moisture		1			66254	04/30/20 11:10	YR9U	ECL 2
		Instrument ID: NOEQUIP								

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

ECL 2 = Eurofins Calscience LLC Lampson, 7445 Lampson Ave, Garden Grove, CA 92841, TEL (714)895-5494

Eurofins Calscience LLC



Accreditation/Certification Summary

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	Los Angeles County Sanitation Districts	10109	09-29-20
California	SCAQMD LAP	17LA0919	11-30-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-20
Nevada	State	CA00111	07-31-20
Oregon	NELAP	CA300001	01-29-21
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-20

Eurofins Calscience LLC



Method Summary

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Method	Method Description	Protocol	Laboratory
9060A	Organic Carbon, Total (TOC)	SW846	ECL 1
Moisture	Percent Moisture	EPA	ECL 2

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

ECL 2 = Eurofins Calscience LLC Lampson, 7445 Lampson Ave, Garden Grove, CA 92841, TEL (714)895-5494

Eurofins Calscience LLC



Sample Summary

Client: BC Laboratories
Project/Site: 2008288

Job ID: 570-27008-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-27008-1	2008288-01	Solid	03/06/20 08:00	04/30/20 10:30	
570-27008-2	2008288-02	Solid	03/06/20 08:05	04/30/20 10:30	
570-27008-3	2008288-03	Solid	03/06/20 09:00	04/30/20 10:30	
570-27008-4	2008288-08	Solid	03/06/20 11:30	04/30/20 10:30	
570-27008-5	2008288-09	Solid	03/06/20 11:35	04/30/20 10:30	
570-27008-6	2008288-10	Solid	03/06/20 11:50	04/30/20 10:30	

Eurofins Calscience LLC



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Subcontract Report for 2008288 PDF File Name: WO_2008288_SUB_CLSCC.pdf Page 14 of 15

SUBCONTRACT ORDER

BC Laboratories
2008288

27008

RUSH!

SENDING LABORATORY:

BC Laboratories
4100 Atlas Ct
Bakersfield, CA 93308
Phone: 661-327-4911
Fax: 661-327-1918
Project Manager: Natalie Serda

RECEIVING LABORATORY:

Eurofins Calscience- Garden Grove SCLSCC-EINV
7440 Lincoln Way
Garden Grove, CA 92841-1427
Phone: (714) 895-5494
Fax: (714) 894-7501

Analysis	Due	Expires	Laboratory ID	Comments
----------	-----	---------	---------------	----------

Sample ID: 2008288-01	Solids	Sampled:03/06/20 08:00	1	Per Sarah Beun standard 8260 list instead of d
-----------------------	--------	------------------------	---	--

oi9060s TOC CLSCC	04/24/20 17:00	04/03/20 08:00		
-------------------	----------------	----------------	--	--

Containers Supplied:

Sample ID: 2008288-02	Solids	Sampled:03/06/20 08:05	2	
-----------------------	--------	------------------------	---	--

oi9060s TOC CLSCC	04/24/20 17:00	04/03/20 08:05		
-------------------	----------------	----------------	--	--

Containers Supplied:

Sample ID: 2008288-03	Solids	Sampled:03/06/20 09:00	3	
-----------------------	--------	------------------------	---	--

oi9060s TOC CLSCC	04/24/20 17:00	04/03/20 09:00		
-------------------	----------------	----------------	--	--

Containers Supplied:

Sample ID: 2008288-08	Solids	Sampled:03/06/20 11:30	4	
-----------------------	--------	------------------------	---	--

oi9060s TOC CLSCC	04/24/20 17:00	04/03/20 11:30		
-------------------	----------------	----------------	--	--

Containers Supplied:

Sample ID: 2008288-09	Solids	Sampled:03/06/20 11:35	5	
-----------------------	--------	------------------------	---	--

oi9060s TOC CLSCC	04/24/20 17:00	04/03/20 11:35		
-------------------	----------------	----------------	--	--

Containers Supplied:

Sample ID: 2008288-10	Solids	Sampled:03/06/20 11:50	6	
-----------------------	--------	------------------------	---	--

oi9060s TOC CLSCC	04/24/20 17:00	04/03/20 11:50		
-------------------	----------------	----------------	--	--

Containers Supplied:



570-27008 Chain of Custody

* Rush ASAP with no surcharge

Released By _____ Date _____

Received By _____ Date _____

Released By _____ Date _____

Received By _____ Date _____

**Login Sample Receipt Checklist**

Client: BC Laboratories

Job Number: 570-27008-1

Login Number: 27008

List Source: Eurofins Calscience

List Number: 1

Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins Calscience

Page 15 of 15

5/4/2020

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/05/2020 9:35
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A01	Detection and quantitation limits are raised due to sample dilution.
A20	Surrogate is low due to matrix interference. Interference verified through second extraction/analysis.
Q02	Matrix spike precision is not within the control limits.
Q03	Matrix spike recovery(s) was(were) not within the control limits.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 04/17/2020

Sarah Battelle

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Client Project: S020.1016
BCL Project: Cottonwood
BCL Work Order: 2008795
Invoice ID: B377494

Enclosed are the results of analyses for samples received by the laboratory on 3/23/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	4
Laboratory / Client Sample Cross Reference.....	6

Sample Results

2008795-01 - 2-0.5

Organochlorine Pesticides (EPA Method 8081A).....	8
Chlorinated Herbicides (EPA Method 8151A).....	9
Volatile Organic Analysis (EPA Method 8260B).....	10
Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C).....	13
EPA Method 1664.....	16
Chemical Analysis.....	17
Total Concentrations (TTLIC).....	18

2008795-02 - 2-1.5

Organochlorine Pesticides (EPA Method 8081A).....	19
Chlorinated Herbicides (EPA Method 8151A).....	20
Volatile Organic Analysis (EPA Method 8260B).....	21
Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C).....	24
EPA Method 1664.....	27
Chemical Analysis.....	28
Total Concentrations (TTLIC).....	29

2008795-03 - 2-6

Organochlorine Pesticides (EPA Method 8081A).....	30
Chlorinated Herbicides (EPA Method 8151A).....	31
Volatile Organic Analysis (EPA Method 8260B).....	32
Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C).....	35
EPA Method 1664.....	38
Chemical Analysis.....	39
Total Concentrations (TTLIC).....	40

Quality Control Reports

Organochlorine Pesticides (EPA Method 8081A)

Method Blank Analysis.....	41
Laboratory Control Sample.....	42
Precision and Accuracy.....	43

Chlorinated Herbicides (EPA Method 8151A)

Method Blank Analysis.....	44
Laboratory Control Sample.....	45
Precision and Accuracy.....	46

Volatile Organic Analysis (EPA Method 8260B)

Method Blank Analysis.....	47
Laboratory Control Sample.....	49
Precision and Accuracy.....	50

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Method Blank Analysis.....	51
Laboratory Control Sample.....	54
Precision and Accuracy.....	55

EPA Method 1664

Method Blank Analysis.....	57
Laboratory Control Sample.....	58
Precision and Accuracy.....	59

Chemical Analysis

Method Blank Analysis.....	60
Laboratory Control Sample.....	61
Precision and Accuracy.....	62

Total Concentrations (TTLIC)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Method Blank Analysis.....	63
Laboratory Control Sample.....	64
Precision and Accuracy.....	65
Subcontract Reports	
WO_2008795_SUB_CLSCC.pdf.....	67
Notes	
Notes and Definitions.....	86



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2008795 Page 2 of 2

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 Of 1							
Submission #: 2008795											
SHIPPING INFORMATION		SHIPPING CONTAINER		FREE LIQUID							
Fed Ex ☒ UPS ☐ Ontrac ☐ Hand Delivery ☐		Ice Chest ☐ None ☐ Box ☐		YES ☐ NO ☐							
BC Lab Field Service ☐ Other ☐ (Specify) _____		Other ☐ (Specify) _____		W / S							
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: Not enough ice											
Custody Seals: Ice Chest ☐ Containers ☐ None ☒ Comments:											
Intact? Yes ☐ No ☐		Intact? Yes ☐ No ☐									
All samples received? Yes ☒ No ☐		All samples containers intact? Yes ☒ No ☐		Description(s) match COC? Yes ☒ No ☐							
COC Received ☒ YES ☐ NO		Emissivity: 0.95 Container: 511.6 Sleeve Thermometer ID: 274		Date/Time: 3/23/20 Analyst Init: KJG							
Temperature: (A) 11.6 °C / (C) 11.6 °C											
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES											
4oz / 8oz / 16oz PE UNPRES											
2oz Cr ⁴											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz											
PT CYANIDE											
PT NITROGEN FORMS											
PT TOTAL SULFIDE											
2oz. NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON											
PT CHEMICAL OXYGEN DEMAND											
PCA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL											
QT EPA 1664											
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40 ml VOA VIAL- 504											
QT EPA 503/606/6080											
QT EPA 515.1/6150											
QT EPA 525											
QT EPA 525 TRAVEL BLANK											
40ml EPA 547											
40ml EPA 531.1											
8oz EPA 548											
QT EPA 549											
QT EPA 8015M											
QT EPA 8270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz IAR											
SOIL SLEEVE		AB	AB	AB	AB	AB	AB	AB	AB	AB	
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments:

Sample Numbering Completed By: GJG

= Actual / C = Corrected

Date/Time: 3/23/2012

Rev 21 05/23/2016

(S:\WPDoc\Word\Perfor\LAB_DOC\FORMS\ISAWRECRev 20)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2008795-01	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 08:05
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-0.5	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-02	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 08:10
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-1.5	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-03	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 08:20
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-6	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-04	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 08:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-11	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-05	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 08:40
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-16	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-06	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 08:50
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-21	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-07	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 09:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-26	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2008795-08	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 09:10
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-36	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil
2008795-09	COC Number:	---	Receive Date:	03/23/2020 15:40
	Project Number:	---	Sampling Date:	03/20/2020 09:20
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	2-40	Lab Matrix:	Solids
	Sampled By:	---	Sample Type:	Soil

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	ND	mg/kg	0.00050	0.000095	EPA-8081A	1.0		1
4,4'-DDT	ND	mg/kg	0.00050	0.000040	EPA-8081A	1.0		1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	72.4	%	20 - 130 (LCL - UCL)		EPA-8081A			1
Decachlorobiphenyl (Surrogate)	66.5	%	40 - 130 (LCL - UCL)		EPA-8081A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/26/20 14:30	03/27/20 20:54	HKS	GC-17	0.987	B074101	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	50.7	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/26/20 13:40	03/27/20 14:32	OLH	GC-8	0.984	B074098	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B		V01	1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B		V01	1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	109	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	99.4	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	90.4	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-01			Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM												
Run #		Method		Prep Date		Run Date/Time		Analyst		Instrument		Dilution		QC Batch ID	
1		EPA-8260B		03/24/20 07:26		03/24/20 13:42		BYM		MS-V2		1		B073650 EPA 5030 Soil MS	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Acenaphthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Acenaphthylene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Aldrin	ND	mg/kg	0.10	0.0067	EPA-8270C	1.4		1
Aniline	ND	mg/kg	0.20	0.011	EPA-8270C			1
Anthracene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzidine	ND	mg/kg	3.0	0.0093	EPA-8270C			1
Benzo[a]anthracene	ND	mg/kg	0.10	0.0077	EPA-8270C			1
Benzo[b]fluoranthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzo[k]fluoranthene	ND	mg/kg	0.10	0.0082	EPA-8270C			1
Benzo[a]pyrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzo[g,h,i]perylene	ND	mg/kg	0.10	0.013	EPA-8270C			1
Benzoic acid	ND	mg/kg	0.50	0.014	EPA-8270C			1
Benzyl alcohol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzyl butyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
alpha-BHC	ND	mg/kg	0.10	0.0067	EPA-8270C			1
beta-BHC	ND	mg/kg	0.10	0.0075	EPA-8270C			1
delta-BHC	ND	mg/kg	0.10	0.0067	EPA-8270C			1
gamma-BHC (Lindane)	ND	mg/kg	0.10	0.0067	EPA-8270C	4.0		1
bis(2-Chloroethoxy)methane	ND	mg/kg	0.10	0.0067	EPA-8270C			1
bis(2-Chloroethyl) ether	ND	mg/kg	0.10	0.0097	EPA-8270C			1
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.20	0.0067	EPA-8270C			1
4-Bromophenyl phenyl ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chloroaniline	ND	mg/kg	0.10	0.015	EPA-8270C			1
2-Chloronaphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chlorophenyl phenyl ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Chrysene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4,4'-DDD	ND	mg/kg	0.10	0.0067	EPA-8270C	1.0		1
4,4'-DDE	ND	mg/kg	0.10	0.0068	EPA-8270C	1.0		1
4,4'-DDT	ND	mg/kg	0.10	0.0067	EPA-8270C	1.0		1
Dibenzo[a,h]anthracene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Dibenzofuran	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
1,3-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,4-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3,3-Dichlorobenzidine	ND	mg/kg	0.20	0.0067	EPA-8270C			1
Dieldrin	ND	mg/kg	0.10	0.0077	EPA-8270C	8.0		1
Diethyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Dimethyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Di-n-butyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dinitrotoluene	ND	mg/kg	0.10	0.0085	EPA-8270C			1
2,6-Dinitrotoluene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Di-n-octyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2-Diphenylhydrazine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Endosulfan I	ND	mg/kg	0.20	0.0088	EPA-8270C			1
Endosulfan II	ND	mg/kg	0.20	0.0088	EPA-8270C			1
Endosulfan sulfate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Endrin	ND	mg/kg	0.20	0.0086	EPA-8270C	0.2		1
Endrin aldehyde	ND	mg/kg	0.50	0.0070	EPA-8270C			1
Fluoranthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Fluorene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Heptachlor	ND	mg/kg	0.10	0.0067	EPA-8270C	4.7		1
Heptachlor epoxide	ND	mg/kg	0.10	0.013	EPA-8270C			1
Hexachlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Hexachlorobutadiene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Hexachlorocyclopentadiene	ND	mg/kg	0.10	0.015	EPA-8270C			1
Hexachloroethane	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Indeno[1,2,3-cd]pyrene	ND	mg/kg	0.10	0.0069	EPA-8270C			1
Isophorone	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2-Methylnaphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Naphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2-Naphthylamine	ND	mg/kg	3.0	0.036	EPA-8270C			1
2-Nitroaniline	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3-Nitroaniline	ND	mg/kg	0.20	0.0067	EPA-8270C			1
4-Nitroaniline	ND	mg/kg	0.20	0.011	EPA-8270C			1
Nitrobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
N-Nitrosodimethylamine	ND	mg/kg	0.10	0.040	EPA-8270C			1
N-Nitrosodi-N-propylamine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
N-Nitrosodiphenylamine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Phenanthrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Pyrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chloro-3-methylphenol	ND	mg/kg	0.20	0.0067	EPA-8270C			1
2-Chlorophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dichlorophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dimethylphenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.50	0.0067	EPA-8270C			1
2,4-Dinitrophenol	ND	mg/kg	0.50	0.0067	EPA-8270C			1
2-Methylphenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3- & 4-Methylphenol	ND	mg/kg	0.20	0.014	EPA-8270C			1
2-Nitrophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Nitrophenol	ND	mg/kg	0.20	0.018	EPA-8270C			1
Pentachlorophenol	ND	mg/kg	0.20	0.017	EPA-8270C	17		1
Phenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4,5-Trichlorophenol	ND	mg/kg	0.20	0.011	EPA-8270C			1
2,4,6-Trichlorophenol	ND	mg/kg	0.20	0.0067	EPA-8270C			1
2-Fluorophenol (Surrogate)	61.8	%	20 - 130 (LCL - UCL)		EPA-8270C			1
Phenol-d5 (Surrogate)	64.5	%	30 - 130 (LCL - UCL)		EPA-8270C			1
Nitrobenzene-d5 (Surrogate)	57.9	%	30 - 130 (LCL - UCL)		EPA-8270C			1
2-Fluorobiphenyl (Surrogate)	40.9	%	30 - 140 (LCL - UCL)		EPA-8270C			1
2,4,6-Tribromophenol (Surrogate)	60.4	%	20 - 150 (LCL - UCL)		EPA-8270C			1
p-Terphenyl-d14 (Surrogate)	42.0	%	30 - 150 (LCL - UCL)		EPA-8270C			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8270C	03/24/20 19:00	03/25/20 18:11	MK1	HPCHEM	0.950	B073980	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

BCL Sample ID:	2008795-01	Client Sample Name:	2-0.5, 3/20/2020 8:05:00AM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	16	mg/kg	50	16	EPA-1664A HEM	ND	J	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-1664A HEM	03/27/20 08:00	03/27/20 12:24	MAM	MAN-SV	1.008	B074123	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chemical Analysis

BCL Sample ID:	2008795-01	Client Sample Name:	2-0.5, 3/20/2020 8:05:00AM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Nitrogen	200	mg/kg	60	20	Calc	ND		1
Nitrate as N	1.8	mg/kg	1.0	0.26	EPA-300.0	ND		2
Total Kjeldahl Nitrogen	200	mg/kg	40	13	EPA-351.2	ND		3
Total Phosphorus	230	mg/kg	50	16	EPA-365.4	ND	A07	4

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	Calc	03/24/20 12:01	04/07/20 12:01	AMM	Calc	1	B^C0235	Calc
2	EPA-300.0	04/01/20 14:00	04/02/20 18:41	MRC	IC5	1	B074450	Water Extract X10
3	EPA-351.2	03/24/20 17:00	03/25/20 14:03	JMH2	SC-2	1	B073888	EPA 351.2
4	EPA-365.4	03/24/20 17:00	03/25/20 10:50	JMH2	SC-1	5	B073889	EPA 365.4

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLIC)

BCL Sample ID: 2008795-01		Client Sample Name: 2-0.5, 3/20/2020 8:05:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Antimony	ND	mg/kg	0.50	0.080	EPA-6020	500		1
Arsenic	0.59	mg/kg	0.50	0.17	EPA-6020	500		2
Barium	44	mg/kg	0.25	0.054	EPA-6020	10000		3
Beryllium	0.066	mg/kg	0.25	0.041	EPA-6020	75	J	2
Cadmium	ND	mg/kg	0.25	0.048	EPA-6020	100		3
Chromium	8.3	mg/kg	0.75	0.25	EPA-6020	2500		2
Cobalt	3.2	mg/kg	0.25	0.049	EPA-6020	8000		2
Copper	7.3	mg/kg	0.50	0.099	EPA-6020	2500		2
Lead	1.7	mg/kg	0.25	0.12	EPA-6020	1000		2
Mercury	ND	mg/kg	0.16	0.016	EPA-7471A	20		4
Molybdenum	0.13	mg/kg	0.25	0.045	EPA-6020	3500	J	3
Nickel	3.2	mg/kg	0.50	0.11	EPA-6020	2000		2
Selenium	ND	mg/kg	0.50	0.11	EPA-6020	100		2
Silver	ND	mg/kg	0.25	0.051	EPA-6020	500		2
Thallium	0.078	mg/kg	0.25	0.049	EPA-6020	700	J	2
Vanadium	29	mg/kg	0.75	0.27	EPA-6020	2400		2
Zinc	18	mg/kg	2.5	0.50	EPA-6020	5000		3
Iron	10000	mg/kg	25	8.5	EPA-6010B		A07	5
Magnesium	2000	mg/kg	2.5	1.3	EPA-6010B			6

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-6020	03/24/20 12:05	03/26/20 10:14	ARD	PE-EL2	1	B073841	EPA 3050B
2	EPA-6020	03/24/20 12:05	03/24/20 16:38	ARD	PE-EL4	1	B073841	EPA 3050B
3	EPA-6020	03/24/20 12:05	03/25/20 12:36	ARD	PE-EL4	1	B073841	EPA 3050B
4	EPA-7471A	03/25/20 09:30	03/25/20 12:40	TMT	CETAC3	0.992	B073913	EPA 7471A
5	EPA-6010B	03/25/20 09:30	03/27/20 18:37	KDF	PE-OP4	5	B073934	EPA 3050B
6	EPA-6010B	03/25/20 09:30	03/25/20 19:55	KDF	PE-OP4	1	B073934	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1
4,4'-DDE	ND	mg/kg	0.00050	0.000095	EPA-8081A	1.0		1
4,4'-DDT	ND	mg/kg	0.00050	0.000040	EPA-8081A	1.0		1
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1
TCMX (Surrogate)	89.8	%	20 - 130 (LCL - UCL)		EPA-8081A			1
Decachlorobiphenyl (Surrogate)	85.8	%	40 - 130 (LCL - UCL)		EPA-8081A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/26/20 14:30	03/27/20 21:44	HKS	GC-17	0.984	B074101	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	55.8	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/26/20 13:40	03/27/20 14:53	OLH	GC-8	1.017	B074098	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B		V01	1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B		V01	1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	107	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	102	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	89.1	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	
1	EPA-8260B	03/24/20 07:26	03/24/20 14:08	BYM	MS-V2	1	B073650	EPA 5030 Soil MS

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Acenaphthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Acenaphthylene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Aldrin	ND	mg/kg	0.10	0.0067	EPA-8270C	1.4		1
Aniline	ND	mg/kg	0.20	0.011	EPA-8270C			1
Anthracene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzidine	ND	mg/kg	3.0	0.0093	EPA-8270C			1
Benzo[a]anthracene	ND	mg/kg	0.10	0.0077	EPA-8270C			1
Benzo[b]fluoranthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzo[k]fluoranthene	ND	mg/kg	0.10	0.0082	EPA-8270C			1
Benzo[a]pyrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzo[g,h,i]perylene	ND	mg/kg	0.10	0.013	EPA-8270C			1
Benzoic acid	ND	mg/kg	0.50	0.014	EPA-8270C			1
Benzyl alcohol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzyl butyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
alpha-BHC	ND	mg/kg	0.10	0.0067	EPA-8270C			1
beta-BHC	ND	mg/kg	0.10	0.0075	EPA-8270C			1
delta-BHC	ND	mg/kg	0.10	0.0067	EPA-8270C			1
gamma-BHC (Lindane)	ND	mg/kg	0.10	0.0067	EPA-8270C	4.0		1
bis(2-Chloroethoxy)methane	ND	mg/kg	0.10	0.0067	EPA-8270C			1
bis(2-Chloroethyl) ether	ND	mg/kg	0.10	0.0097	EPA-8270C			1
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.20	0.0067	EPA-8270C			1
4-Bromophenyl phenyl ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chloroaniline	ND	mg/kg	0.10	0.015	EPA-8270C			1
2-Chloronaphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chlorophenyl phenyl ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Chrysene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4,4'-DDD	ND	mg/kg	0.10	0.0067	EPA-8270C	1.0		1
4,4'-DDE	ND	mg/kg	0.10	0.0068	EPA-8270C	1.0		1
4,4'-DDT	ND	mg/kg	0.10	0.0067	EPA-8270C	1.0		1
Dibenzo[a,h]anthracene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Dibenzofuran	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
1,3-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,4-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3,3-Dichlorobenzidine	ND	mg/kg	0.20	0.0067	EPA-8270C			1
Dieldrin	ND	mg/kg	0.10	0.0077	EPA-8270C	8.0		1
Diethyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Dimethyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Di-n-butyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dinitrotoluene	ND	mg/kg	0.10	0.0085	EPA-8270C			1
2,6-Dinitrotoluene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Di-n-octyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2-Diphenylhydrazine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Endosulfan I	ND	mg/kg	0.20	0.0088	EPA-8270C			1
Endosulfan II	ND	mg/kg	0.20	0.0088	EPA-8270C			1
Endosulfan sulfate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Endrin	ND	mg/kg	0.20	0.0086	EPA-8270C	0.2		1
Endrin aldehyde	ND	mg/kg	0.50	0.0070	EPA-8270C			1
Fluoranthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Fluorene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Heptachlor	ND	mg/kg	0.10	0.0067	EPA-8270C	4.7		1
Heptachlor epoxide	ND	mg/kg	0.10	0.013	EPA-8270C			1
Hexachlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Hexachlorobutadiene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Hexachlorocyclopentadiene	ND	mg/kg	0.10	0.015	EPA-8270C			1
Hexachloroethane	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Indeno[1,2,3-cd]pyrene	ND	mg/kg	0.10	0.0069	EPA-8270C			1
Isophorone	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2-Methylnaphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Naphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2-Naphthylamine	ND	mg/kg	3.0	0.036	EPA-8270C			1
2-Nitroaniline	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3-Nitroaniline	ND	mg/kg	0.20	0.0067	EPA-8270C			1
4-Nitroaniline	ND	mg/kg	0.20	0.011	EPA-8270C			1
Nitrobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
N-Nitrosodimethylamine	ND	mg/kg	0.10	0.040	EPA-8270C			1
N-Nitrosodi-N-propylamine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
N-Nitrosodiphenylamine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Phenanthrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Pyrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chloro-3-methylphenol	ND	mg/kg	0.20	0.0067	EPA-8270C			1
2-Chlorophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dichlorophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dimethylphenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.50	0.0067	EPA-8270C			1
2,4-Dinitrophenol	ND	mg/kg	0.50	0.0067	EPA-8270C			1
2-Methylphenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3- & 4-Methylphenol	ND	mg/kg	0.20	0.014	EPA-8270C			1
2-Nitrophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Nitrophenol	ND	mg/kg	0.20	0.018	EPA-8270C			1
Pentachlorophenol	ND	mg/kg	0.20	0.017	EPA-8270C	17		1
Phenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4,5-Trichlorophenol	ND	mg/kg	0.20	0.011	EPA-8270C			1
2,4,6-Trichlorophenol	ND	mg/kg	0.20	0.0067	EPA-8270C			1
2-Fluorophenol (Surrogate)	68.1	%	20 - 130 (LCL - UCL)		EPA-8270C			1
Phenol-d5 (Surrogate)	70.4	%	30 - 130 (LCL - UCL)		EPA-8270C			1
Nitrobenzene-d5 (Surrogate)	67.5	%	30 - 130 (LCL - UCL)		EPA-8270C			1
2-Fluorobiphenyl (Surrogate)	71.4	%	30 - 140 (LCL - UCL)		EPA-8270C			1
2,4,6-Tribromophenol (Surrogate)	71.3	%	20 - 150 (LCL - UCL)		EPA-8270C			1
p-Terphenyl-d14 (Surrogate)	62.7	%	30 - 150 (LCL - UCL)		EPA-8270C			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8270C	03/24/20 19:00	03/25/20 18:39	MK1	HPCHEM	0.993	B073980	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/kg	50	16	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-1664A HEM	03/27/20 08:00	03/27/20 12:24		MAM	MAN-SV	1.008	B074123	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chemical Analysis

BCL Sample ID:	2008795-02	Client Sample Name:	2-1.5, 3/20/2020 8:10:00AM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Nitrogen	190	mg/kg	60	20	Calc	ND		1
Nitrate as N	1.2	mg/kg	1.0	0.26	EPA-300.0	ND		2
Total Kjeldahl Nitrogen	190	mg/kg	40	13	EPA-351.2	ND		3
Total Phosphorus	370	mg/kg	10	3.2	EPA-365.4	ND		4

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	Calc	03/24/20 12:01	04/07/20 12:01	AMM	Calc	1	B^C0235	Calc
2	EPA-300.0	04/01/20 14:00	04/02/20 19:53	MRC	IC5	1	B074450	Water Extract X10
3	EPA-351.2	03/24/20 17:00	03/25/20 12:30	JMH2	SC-2	1	B073888	EPA 351.2
4	EPA-365.4	03/24/20 17:00	03/25/20 10:15	JMH2	SC-1	1	B073889	EPA 365.4

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLIC)

BCL Sample ID: 2008795-02		Client Sample Name: 2-1.5, 3/20/2020 8:10:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #
Antimony	ND	mg/kg	0.50	0.080	EPA-6020	500		1
Arsenic	0.38	mg/kg	0.50	0.17	EPA-6020	500	J	2
Barium	30	mg/kg	0.25	0.054	EPA-6020	10000		3
Beryllium	ND	mg/kg	0.25	0.041	EPA-6020	75		2
Cadmium	ND	mg/kg	0.25	0.048	EPA-6020	100		3
Chromium	5.5	mg/kg	0.75	0.25	EPA-6020	2500		2
Cobalt	1.6	mg/kg	0.25	0.049	EPA-6020	8000		2
Copper	3.4	mg/kg	0.50	0.099	EPA-6020	2500		2
Lead	0.73	mg/kg	0.25	0.12	EPA-6020	1000		2
Mercury	ND	mg/kg	0.16	0.016	EPA-7471A	20		4
Molybdenum	0.096	mg/kg	0.25	0.045	EPA-6020	3500	J	3
Nickel	1.8	mg/kg	0.50	0.11	EPA-6020	2000		2
Selenium	ND	mg/kg	0.50	0.11	EPA-6020	100		2
Silver	ND	mg/kg	0.25	0.051	EPA-6020	500		2
Thallium	ND	mg/kg	0.25	0.049	EPA-6020	700		2
Vanadium	20	mg/kg	0.75	0.27	EPA-6020	2400		2
Zinc	9.1	mg/kg	2.5	0.50	EPA-6020	5000		3
Iron	9000	mg/kg	25	8.5	EPA-6010B			5
Magnesium	1100	mg/kg	2.5	1.3	EPA-6010B			6

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-6020	03/24/20 12:05	03/26/20 10:29	ARD	PE-EL2	0.990	B073841	EPA 3050B
2	EPA-6020	03/24/20 12:05	03/24/20 16:54	ARD	PE-EL4	0.990	B073841	EPA 3050B
3	EPA-6020	03/24/20 12:05	03/25/20 12:58	ARD	PE-EL4	0.990	B073841	EPA 3050B
4	EPA-7471A	03/25/20 09:30	03/25/20 12:42	TMT	CETAC3	0.992	B073913	EPA 7471A
5	EPA-6010B	03/25/20 09:30	03/27/20 18:45	KDF	PE-OP4	4.854	B073934	EPA 3050B
6	EPA-6010B	03/25/20 09:30	03/25/20 20:02	KDF	PE-OP4	0.971	B073934	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM							
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #	
Aldrin	ND	mg/kg	0.00050	0.000018	EPA-8081A	1.4		1	
alpha-BHC	ND	mg/kg	0.00050	0.000038	EPA-8081A			1	
beta-BHC	ND	mg/kg	0.00050	0.000048	EPA-8081A			1	
delta-BHC	ND	mg/kg	0.00050	0.000037	EPA-8081A			1	
gamma-BHC (Lindane)	ND	mg/kg	0.00050	0.000018	EPA-8081A	4.0		1	
Chlordane (Technical)	ND	mg/kg	0.050	0.0010	EPA-8081A	2.5		1	
4,4'-DDD	ND	mg/kg	0.00050	0.000064	EPA-8081A	1.0		1	
4,4'-DDE	ND	mg/kg	0.00050	0.000095	EPA-8081A	1.0		1	
4,4'-DDT	ND	mg/kg	0.00050	0.000040	EPA-8081A	1.0		1	
Dieldrin	ND	mg/kg	0.00050	0.000036	EPA-8081A	8.0		1	
Endosulfan I	ND	mg/kg	0.00050	0.000020	EPA-8081A			1	
Endosulfan II	ND	mg/kg	0.00050	0.000034	EPA-8081A			1	
Endosulfan sulfate	ND	mg/kg	0.00050	0.000026	EPA-8081A			1	
Endrin	ND	mg/kg	0.00050	0.000065	EPA-8081A	0.2		1	
Endrin aldehyde	ND	mg/kg	0.00050	0.000018	EPA-8081A			1	
Heptachlor	ND	mg/kg	0.00050	0.000086	EPA-8081A	4.7		1	
Heptachlor epoxide	ND	mg/kg	0.00050	0.000017	EPA-8081A			1	
Methoxychlor	ND	mg/kg	0.00050	0.000094	EPA-8081A	100		1	
Toxaphene	ND	mg/kg	0.050	0.0014	EPA-8081A	5		1	
TCMX (Surrogate)	43.6	%	20 - 130 (LCL - UCL)		EPA-8081A			1	
Decachlorobiphenyl (Surrogate)	31.3	%	40 - 130 (LCL - UCL)		EPA-8081A		A20	1	

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8081A	03/26/20 14:30	03/27/20 22:00	HKS	GC-17	0.984	B074101	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
2,4-D	ND	mg/kg	0.020	0.0030	EPA-8151A	100		1
2,4-DB	ND	mg/kg	0.040	0.0067	EPA-8151A			1
Dalapon	ND	mg/kg	0.050	0.0068	EPA-8151A			1
Dicamba	ND	mg/kg	0.0020	0.00057	EPA-8151A			1
Dichloroprop	ND	mg/kg	0.020	0.0037	EPA-8151A			1
Dinoseb	ND	mg/kg	0.0070	0.0020	EPA-8151A			1
2,4,5-T	ND	mg/kg	0.0030	0.0011	EPA-8151A			1
2,4,5-TP (Silvex)	ND	mg/kg	0.0030	0.00073	EPA-8151A	10		1
2,4-Dichlorophenylacetic acid (Surrogate)	43.2	%	40 - 120 (LCL - UCL)		EPA-8151A			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8151A	03/26/20 13:40	03/27/20 15:14	OLH	GC-8	1.010	B074098	EPA 3550B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Bromobenzene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Bromochloromethane	ND	mg/kg	0.0050	0.0014	EPA-8260B			1
Bromodichloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Bromoform	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Bromomethane	ND	mg/kg	0.0050	0.0024	EPA-8260B		V01	1
n-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
sec-Butylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
tert-Butylbenzene	ND	mg/kg	0.0050	0.0024	EPA-8260B			1
Carbon tetrachloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
Chloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Chloroform	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Chloromethane	ND	mg/kg	0.0050	0.0017	EPA-8260B		V01	1
2-Chlorotoluene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
4-Chlorotoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Dibromochloromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Dibromomethane	ND	mg/kg	0.0050	0.0016	EPA-8260B			1
1,2-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,3-Dichlorobenzene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,4-Dichlorobenzene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
Dichlorodifluoromethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
1,1-Dichloroethene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,2-Dichloropropane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
1,3-Dichloropropane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
2,2-Dichloropropane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1-Dichloropropene	ND	mg/kg	0.0050	0.0019	EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
trans-1,3-Dichloropropene	ND	mg/kg	0.0050	0.0018	EPA-8260B			1
Ethylbenzene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Hexachlorobutadiene	ND	mg/kg	0.0050	0.0031	EPA-8260B			1
Isopropylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
p-Isopropyltoluene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Methylene chloride	ND	mg/kg	0.010	0.0015	EPA-8260B			1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.0017	EPA-8260B			1
Naphthalene	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
n-Propylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Styrene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Tetrachloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B			1
Toluene	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,3-Trichlorobenzene	ND	mg/kg	0.0050	0.0026	EPA-8260B			1
1,2,4-Trichlorobenzene	ND	mg/kg	0.0050	0.0027	EPA-8260B			1
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,1,2-Trichloroethane	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Trichloroethene	ND	mg/kg	0.0050	0.0022	EPA-8260B	2040		1
Trichlorofluoromethane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,2,3-Trichloropropane	ND	mg/kg	0.0050	0.0023	EPA-8260B			1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	mg/kg	0.0050	0.0020	EPA-8260B			1
1,2,4-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,3,5-Trimethylbenzene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
Vinyl chloride	ND	mg/kg	0.0050	0.0019	EPA-8260B			1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B			1
p- & m-Xylenes	ND	mg/kg	0.0050	0.0038	EPA-8260B			1
o-Xylene	ND	mg/kg	0.0050	0.0021	EPA-8260B			1
1,2-Dichloroethane-d4 (Surrogate)	102	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	99.4	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	85.7	%	74 - 121 (LCL - UCL)		EPA-8260B			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 2008795-03			Client Sample Name: 2-6, 3/20/2020 8:20:00AM								
			Run						QC		
Run #	Method	Prep Date	Date/Time	Analyst	Instrument	Dilution	Batch ID				
1	EPA-8260B	03/24/20 07:26	03/24/20 14:35	BYM	MS-V2	1	B073650	EPA 5030 Soil MS			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Acenaphthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Acenaphthylene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Aldrin	ND	mg/kg	0.10	0.0067	EPA-8270C	1.4		1
Aniline	ND	mg/kg	0.20	0.011	EPA-8270C			1
Anthracene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzidine	ND	mg/kg	3.0	0.0093	EPA-8270C			1
Benzo[a]anthracene	ND	mg/kg	0.10	0.0077	EPA-8270C			1
Benzo[b]fluoranthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzo[k]fluoranthene	ND	mg/kg	0.10	0.0082	EPA-8270C			1
Benzo[a]pyrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzo[g,h,i]perylene	ND	mg/kg	0.10	0.013	EPA-8270C			1
Benzoic acid	ND	mg/kg	0.50	0.014	EPA-8270C			1
Benzyl alcohol	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Benzyl butyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
alpha-BHC	ND	mg/kg	0.10	0.0067	EPA-8270C			1
beta-BHC	ND	mg/kg	0.10	0.0075	EPA-8270C			1
delta-BHC	ND	mg/kg	0.10	0.0067	EPA-8270C			1
gamma-BHC (Lindane)	ND	mg/kg	0.10	0.0067	EPA-8270C	4.0		1
bis(2-Chloroethoxy)methane	ND	mg/kg	0.10	0.0067	EPA-8270C			1
bis(2-Chloroethyl) ether	ND	mg/kg	0.10	0.0097	EPA-8270C			1
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.20	0.0067	EPA-8270C			1
4-Bromophenyl phenyl ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chloroaniline	ND	mg/kg	0.10	0.015	EPA-8270C			1
2-Chloronaphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4-Chlorophenyl phenyl ether	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Chrysene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
4,4'-DDD	ND	mg/kg	0.10	0.0067	EPA-8270C	1.0		1
4,4'-DDE	ND	mg/kg	0.10	0.0068	EPA-8270C	1.0		1
4,4'-DDT	ND	mg/kg	0.10	0.0067	EPA-8270C	1.0		1
Dibenzo[a,h]anthracene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Dibenzofuran	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLT Limits	Lab Quals	Run #
1,3-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,4-Dichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3,3-Dichlorobenzidine	ND	mg/kg	0.20	0.0067	EPA-8270C			1
Dieldrin	ND	mg/kg	0.10	0.0077	EPA-8270C	8.0		1
Diethyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Dimethyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Di-n-butyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2,4-Dinitrotoluene	ND	mg/kg	0.10	0.0085	EPA-8270C			1
2,6-Dinitrotoluene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Di-n-octyl phthalate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
1,2-Diphenylhydrazine	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Endosulfan I	ND	mg/kg	0.20	0.0088	EPA-8270C			1
Endosulfan II	ND	mg/kg	0.20	0.0088	EPA-8270C			1
Endosulfan sulfate	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Endrin	ND	mg/kg	0.20	0.0086	EPA-8270C	0.2		1
Endrin aldehyde	ND	mg/kg	0.50	0.0070	EPA-8270C			1
Fluoranthene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Fluorene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Heptachlor	ND	mg/kg	0.10	0.0067	EPA-8270C	4.7		1
Heptachlor epoxide	ND	mg/kg	0.10	0.013	EPA-8270C			1
Hexachlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Hexachlorobutadiene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Hexachlorocyclopentadiene	ND	mg/kg	0.10	0.015	EPA-8270C			1
Hexachloroethane	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Indeno[1,2,3-cd]pyrene	ND	mg/kg	0.10	0.0069	EPA-8270C			1
Isophorone	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2-Methylnaphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
Naphthalene	ND	mg/kg	0.10	0.0067	EPA-8270C			1
2-Naphthylamine	ND	mg/kg	3.0	0.036	EPA-8270C			1
2-Nitroaniline	ND	mg/kg	0.10	0.0067	EPA-8270C			1
3-Nitroaniline	ND	mg/kg	0.20	0.0067	EPA-8270C			1
4-Nitroaniline	ND	mg/kg	0.20	0.011	EPA-8270C			1
Nitrobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM							
Constituent	Result	Units	PQL	MDL	Method	TTLIC Limits	Lab Quals	Run #	
N-Nitrosodimethylamine	ND	mg/kg	0.10	0.040	EPA-8270C			1	
N-Nitrosodi-N-propylamine	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
N-Nitrosodiphenylamine	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
Phenanthrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
Pyrene	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
1,2,4-Trichlorobenzene	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
4-Chloro-3-methylphenol	ND	mg/kg	0.20	0.0067	EPA-8270C			1	
2-Chlorophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
2,4-Dichlorophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
2,4-Dimethylphenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.50	0.0067	EPA-8270C			1	
2,4-Dinitrophenol	ND	mg/kg	0.50	0.0067	EPA-8270C			1	
2-Methylphenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
3- & 4-Methylphenol	ND	mg/kg	0.20	0.014	EPA-8270C			1	
2-Nitrophenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
4-Nitrophenol	ND	mg/kg	0.20	0.018	EPA-8270C			1	
Pentachlorophenol	ND	mg/kg	0.20	0.017	EPA-8270C	17		1	
Phenol	ND	mg/kg	0.10	0.0067	EPA-8270C			1	
2,4,5-Trichlorophenol	ND	mg/kg	0.20	0.011	EPA-8270C			1	
2,4,6-Trichlorophenol	ND	mg/kg	0.20	0.0067	EPA-8270C			1	
2-Fluorophenol (Surrogate)	69.0	%	20 - 130 (LCL - UCL)		EPA-8270C			1	
Phenol-d5 (Surrogate)	71.7	%	30 - 130 (LCL - UCL)		EPA-8270C			1	
Nitrobenzene-d5 (Surrogate)	62.1	%	30 - 130 (LCL - UCL)		EPA-8270C			1	
2-Fluorobiphenyl (Surrogate)	49.5	%	30 - 140 (LCL - UCL)		EPA-8270C			1	
2,4,6-Tribromophenol (Surrogate)	63.0	%	20 - 150 (LCL - UCL)		EPA-8270C			1	
p-Terphenyl-d14 (Surrogate)	50.6	%	30 - 150 (LCL - UCL)		EPA-8270C			1	

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-8270C	03/24/20 19:00	03/25/20 19:06	MK1	HPCHEM	0.997	B073980	EPA 3550B



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

BCL Sample ID: 2008795-03		Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/kg	50	16	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-1664A HEM	03/27/20 08:00	03/27/20 12:24		MAM	MAN-SV	1.002	B074123	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chemical Analysis

BCL Sample ID:	2008795-03	Client Sample Name:	2-6, 3/20/2020 8:20:00AM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Nitrogen	210	mg/kg	60	20	Calc	ND		1
Nitrate as N	2.9	mg/kg	1.0	0.26	EPA-300.0	ND		2
Total Kjeldahl Nitrogen	200	mg/kg	40	13	EPA-351.2	ND		3
Total Phosphorus	340	mg/kg	10	3.2	EPA-365.4	ND		4

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	Calc	03/24/20 12:01	04/07/20 12:01	AMM	Calc	1	B^C0235	Calc
2	EPA-300.0	04/01/20 14:00	04/02/20 20:11	MRC	IC5	1	B074450	Water Extract X10
3	EPA-351.2	03/24/20 17:00	03/25/20 12:31	JMH2	SC-2	1	B073888	EPA 351.2
4	EPA-365.4	03/24/20 17:00	03/25/20 10:16	JMH2	SC-1	1	B073889	EPA 365.4

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

BCL Sample ID:	2008795-03	Client Sample Name: 2-6, 3/20/2020 8:20:00AM						
Constituent	Result	Units	PQL	MDL	Method	TTLC Limits	Lab Quals	Run #
Antimony	ND	mg/kg	0.50	0.080	EPA-6020	500		1
Arsenic	0.84	mg/kg	0.50	0.17	EPA-6020	500		2
Barium	63	mg/kg	0.25	0.054	EPA-6020	10000		3
Beryllium	0.094	mg/kg	0.25	0.041	EPA-6020	75	J	2
Cadmium	ND	mg/kg	0.25	0.048	EPA-6020	100		3
Chromium	9.6	mg/kg	0.75	0.25	EPA-6020	2500		2
Cobalt	3.7	mg/kg	0.25	0.049	EPA-6020	8000		2
Copper	8.0	mg/kg	0.50	0.099	EPA-6020	2500		2
Lead	1.3	mg/kg	0.25	0.12	EPA-6020	1000		2
Mercury	ND	mg/kg	0.16	0.016	EPA-7471A	20		4
Molybdenum	0.26	mg/kg	0.25	0.045	EPA-6020	3500		3
Nickel	4.1	mg/kg	0.50	0.11	EPA-6020	2000		2
Selenium	ND	mg/kg	0.50	0.11	EPA-6020	100		2
Silver	ND	mg/kg	0.25	0.051	EPA-6020	500		2
Thallium	0.11	mg/kg	0.25	0.049	EPA-6020	700	J	2
Vanadium	30	mg/kg	0.75	0.27	EPA-6020	2400		2
Zinc	21	mg/kg	2.5	0.50	EPA-6020	5000		3
Iron	12000	mg/kg	25	8.5	EPA-6010B			5
Magnesium	2100	mg/kg	2.5	1.3	EPA-6010B			6

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-6020	03/24/20 12:05	03/26/20 10:31	ARD	PE-EL2	0.990	B073841	EPA 3050B
2	EPA-6020	03/24/20 12:05	03/24/20 16:57	ARD	PE-EL4	0.990	B073841	EPA 3050B
3	EPA-6020	03/24/20 12:05	03/25/20 13:00	ARD	PE-EL4	0.990	B073841	EPA 3050B
4	EPA-7471A	03/25/20 09:30	03/25/20 12:44	TMT	CETAC3	1.025	B073913	EPA 7471A
5	EPA-6010B	03/25/20 09:30	03/27/20 18:46	KDF	PE-OP4	5	B073934	EPA 3050B
6	EPA-6010B	03/25/20 09:30	03/25/20 20:03	KDF	PE-OP4	1	B073934	EPA 3050B

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B074101						
Aldrin	B074101-BLK1	ND	mg/kg	0.00050	0.000018	
alpha-BHC	B074101-BLK1	ND	mg/kg	0.00050	0.000038	
beta-BHC	B074101-BLK1	ND	mg/kg	0.00050	0.000048	
delta-BHC	B074101-BLK1	ND	mg/kg	0.00050	0.000037	
gamma-BHC (Lindane)	B074101-BLK1	ND	mg/kg	0.00050	0.000018	
Chlordane (Technical)	B074101-BLK1	ND	mg/kg	0.050	0.0010	
4,4'-DDD	B074101-BLK1	ND	mg/kg	0.00050	0.000064	
4,4'-DDE	B074101-BLK1	ND	mg/kg	0.00050	0.000095	
4,4'-DDT	B074101-BLK1	ND	mg/kg	0.00050	0.000040	
Dieldrin	B074101-BLK1	ND	mg/kg	0.00050	0.000036	
Endosulfan I	B074101-BLK1	ND	mg/kg	0.00050	0.000020	
Endosulfan II	B074101-BLK1	ND	mg/kg	0.00050	0.000034	
Endosulfan sulfate	B074101-BLK1	ND	mg/kg	0.00050	0.000026	
Endrin	B074101-BLK1	ND	mg/kg	0.00050	0.000065	
Endrin aldehyde	B074101-BLK1	ND	mg/kg	0.00050	0.000018	
Heptachlor	B074101-BLK1	ND	mg/kg	0.00050	0.000086	
Heptachlor epoxide	B074101-BLK1	ND	mg/kg	0.00050	0.000017	
Methoxychlor	B074101-BLK1	ND	mg/kg	0.00050	0.000094	
Toxaphene	B074101-BLK1	ND	mg/kg	0.050	0.0014	
TCMX (Surrogate)	B074101-BLK1	87.4	%	20 - 130 (LCL - UCL)		
Decachlorobiphenyl (Surrogate)	B074101-BLK1	93.7	%	40 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B074101										
Aldrin	B074101-BS1	LCS	0.0046805	0.0049505	mg/kg	94.5		70 - 130		
gamma-BHC (Lindane)	B074101-BS1	LCS	0.0051512	0.0049505	mg/kg	104		60 - 140		
4,4'-DDT	B074101-BS1	LCS	0.0060578	0.0049505	mg/kg	122		60 - 140		
Dieldrin	B074101-BS1	LCS	0.0052875	0.0049505	mg/kg	107		70 - 130		
Endrin	B074101-BS1	LCS	0.0055957	0.0049505	mg/kg	113		60 - 140		
Heptachlor	B074101-BS1	LCS	0.0054244	0.0049505	mg/kg	110		60 - 140		
TCMX (Surrogate)	B074101-BS1	LCS	0.0087472	0.0099010	mg/kg	88.3		20 - 130		
Decachlorobiphenyl (Surrogate)	B074101-BS1	LCS	0.018757	0.019802	mg/kg	94.7		40 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B074101		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Aldrin	MS	2008795-01	ND	0.0037080	0.0049834	mg/kg		74.4		50 - 140	
	MSD	2008795-01	ND	0.0038444	0.0050847	mg/kg	3.6	75.6	30	50 - 140	
gamma-BHC (Lindane)	MS	2008795-01	ND	0.0050588	0.0049834	mg/kg		102		50 - 140	
	MSD	2008795-01	ND	0.0052607	0.0050847	mg/kg	3.9	103	30	50 - 140	
4,4'-DDT	MS	2008795-01	ND	0.0055638	0.0049834	mg/kg		112		50 - 140	
	MSD	2008795-01	ND	0.0056932	0.0050847	mg/kg	2.3	112	30	50 - 140	
Dieldrin	MS	2008795-01	ND	0.0047807	0.0049834	mg/kg		95.9		40 - 140	
	MSD	2008795-01	ND	0.0049529	0.0050847	mg/kg	3.5	97.4	30	40 - 140	
Endrin	MS	2008795-01	ND	0.0053332	0.0049834	mg/kg		107		50 - 150	
	MSD	2008795-01	ND	0.0054844	0.0050847	mg/kg	2.8	108	30	50 - 150	
Heptachlor	MS	2008795-01	ND	0.0051296	0.0049834	mg/kg		103		60 - 140	
	MSD	2008795-01	ND	0.0053149	0.0050847	mg/kg	3.5	105	30	60 - 140	
TCMX (Surrogate)	MS	2008795-01	ND	0.0085445	0.0099668	mg/kg		85.7		20 - 130	
	MSD	2008795-01	ND	0.0095681	0.010169	mg/kg	11.3	94.1		20 - 130	
Decachlorobiphenyl (Surrogate)	MS	2008795-01	ND	0.017298	0.019934	mg/kg		86.8		40 - 130	
	MSD	2008795-01	ND	0.017298	0.020339	mg/kg	0.0	85.0		40 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B074098						
2,4-D	B074098-BLK1	ND	mg/kg	0.020	0.0030	
2,4-DB	B074098-BLK1	ND	mg/kg	0.040	0.0067	
Dalapon	B074098-BLK1	ND	mg/kg	0.050	0.0068	
Dicamba	B074098-BLK1	ND	mg/kg	0.0020	0.00057	
Dichloroprop	B074098-BLK1	ND	mg/kg	0.020	0.0037	
Dinoseb	B074098-BLK1	ND	mg/kg	0.0070	0.0020	
2,4,5-T	B074098-BLK1	ND	mg/kg	0.0030	0.0011	
2,4,5-TP (Silvex)	B074098-BLK1	ND	mg/kg	0.0030	0.00073	
2,4-Dichlorophenylacetic acid (Surrogate)	B074098-BLK1	79.3	%	40 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B074098										
2,4-D	B074098-BS1	LCS	0.061311	0.078689	mg/kg	77.9		50 - 120		
2,4-DB	B074098-BS1	LCS	0.11115	0.17705	mg/kg	62.8		50 - 120		
Dicamba	B074098-BS1	LCS	0.017049	0.019672	mg/kg	86.7		50 - 120		
Dichloroprop	B074098-BS1	LCS	0.054754	0.078689	mg/kg	69.6		50 - 120		
Dinoseb	B074098-BS1	LCS	0.024918	0.039344	mg/kg	63.3		50 - 120		
2,4,5-T	B074098-BS1	LCS	0.010164	0.019672	mg/kg	51.7		30 - 120		
2,4,5-TP (Silvex)	B074098-BS1	LCS	0.012787	0.019672	mg/kg	65.0		50 - 120		
2,4-Dichlorophenylacetic acid (Surrogate)	B074098-BS1	LCS	0.099344	0.13115	mg/kg	75.7		40 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chlorinated Herbicides (EPA Method 8151A)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B074098		Used client sample: Y - Description: 2-1.5, 03/20/2020 08:10									
2,4-D	MS	2008795-02	ND	0.061639	0.078689	mg/kg		78.3		40 - 120	
	MSD	2008795-02	ND	0.058667	0.080000	mg/kg	4.9	73.3	30	40 - 120	
2,4-DB	MS	2008795-02	ND	0.10984	0.17705	mg/kg		62.0		50 - 120	
	MSD	2008795-02	ND	0.10367	0.18000	mg/kg	5.8	57.6	30	50 - 120	
Dicamba	MS	2008795-02	ND	0.014426	0.019672	mg/kg		73.3		50 - 120	
	MSD	2008795-02	ND	0.014333	0.020000	mg/kg	0.6	71.7	30	50 - 120	
Dichloroprop	MS	2008795-02	ND	0.051148	0.078689	mg/kg		65.0		40 - 120	
	MSD	2008795-02	ND	0.046333	0.080000	mg/kg	9.9	57.9	30	40 - 120	
Dinoseb	MS	2008795-02	ND	0.020656	0.039344	mg/kg		52.5		40 - 130	
	MSD	2008795-02	ND	0.020667	0.040000	mg/kg	0.1	51.7	30	40 - 130	
2,4,5-T	MS	2008795-02	ND	0.0081967	0.019672	mg/kg		41.7		30 - 120	
	MSD	2008795-02	ND	0.0066667	0.020000	mg/kg	20.6	33.3	30	30 - 120	
2,4,5-TP (Silvex)	MS	2008795-02	ND	0.010820	0.019672	mg/kg		55.0		40 - 120	
	MSD	2008795-02	ND	0.010667	0.020000	mg/kg	1.4	53.3	30	40 - 120	
2,4-Dichlorophenylacetic acid (Surrogate	MS	2008795-02	ND	0.089508	0.13115	mg/kg		68.2		40 - 120	
	MSD	2008795-02	ND	0.088333	0.13333	mg/kg	1.3	66.3		40 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073650						
Benzene	B073650-BLK1	ND	mg/kg	0.0050	0.0018	
Bromobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
Bromochloromethane	B073650-BLK1	ND	mg/kg	0.0050	0.0014	
Bromodichloromethane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
Bromoform	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
Bromomethane	B073650-BLK1	ND	mg/kg	0.0050	0.0024	
n-Butylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
sec-Butylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
tert-Butylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0024	
Carbon tetrachloride	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
Chlorobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
Chloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
Chloroform	B073650-BLK1	ND	mg/kg	0.0050	0.0017	
Chloromethane	B073650-BLK1	ND	mg/kg	0.0050	0.0017	
2-Chlorotoluene	B073650-BLK1	ND	mg/kg	0.0050	0.0018	
4-Chlorotoluene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
Dibromochloromethane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,2-Dibromo-3-chloropropane	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
1,2-Dibromoethane	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
Dibromomethane	B073650-BLK1	ND	mg/kg	0.0050	0.0016	
1,2-Dichlorobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
1,3-Dichlorobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,4-Dichlorobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
Dichlorodifluoromethane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,1-Dichloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
1,2-Dichloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0017	
1,1-Dichloroethene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
cis-1,2-Dichloroethene	B073650-BLK1	ND	mg/kg	0.0050	0.0018	
trans-1,2-Dichloroethene	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
1,2-Dichloropropane	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
1,3-Dichloropropane	B073650-BLK1	ND	mg/kg	0.0050	0.0022	
2,2-Dichloropropane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,1-Dichloropropene	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
cis-1,3-Dichloropropene	B073650-BLK1	ND	mg/kg	0.0050	0.0017	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073650						
trans-1,3-Dichloropropene	B073650-BLK1	ND	mg/kg	0.0050	0.0018	
Ethylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0022	
Hexachlorobutadiene	B073650-BLK1	ND	mg/kg	0.0050	0.0031	
Isopropylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
p-Isopropyltoluene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
Methylene chloride	B073650-BLK1	ND	mg/kg	0.010	0.0015	
Methyl t-butyl ether	B073650-BLK1	ND	mg/kg	0.0050	0.0017	
Naphthalene	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
n-Propylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
Styrene	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,1,2-Tetrachloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,2,2-Tetrachloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0022	
Tetrachloroethene	B073650-BLK1	ND	mg/kg	0.0050	0.0022	
Toluene	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,2,3-Trichlorobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0026	
1,2,4-Trichlorobenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0027	
1,1,1-Trichloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,1,2-Trichloroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
Trichloroethene	B073650-BLK1	ND	mg/kg	0.0050	0.0022	
Trichlorofluoromethane	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
1,2,3-Trichloropropane	B073650-BLK1	ND	mg/kg	0.0050	0.0023	
1,1,2-Trichloro-1,2,2-trifluoroethane	B073650-BLK1	ND	mg/kg	0.0050	0.0020	
1,2,4-Trimethylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
1,3,5-Trimethylbenzene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
Vinyl chloride	B073650-BLK1	ND	mg/kg	0.0050	0.0019	
Total Xylenes	B073650-BLK1	ND	mg/kg	0.010	0.0034	
p- & m-Xylenes	B073650-BLK1	ND	mg/kg	0.0050	0.0038	
o-Xylene	B073650-BLK1	ND	mg/kg	0.0050	0.0021	
1,2-Dichloroethane-d4 (Surrogate)	B073650-BLK1	97.5	%	70 - 121 (LCL - UCL)		
Toluene-d8 (Surrogate)	B073650-BLK1	97.4	%	81 - 117 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	B073650-BLK1	90.4	%	74 - 121 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B073650										
Benzene	B073650-BS1	LCS	0.12967	0.12500	mg/kg	104		70 - 130		
Bromodichloromethane	B073650-BS1	LCS	0.12230	0.12500	mg/kg	97.8		70 - 130		
Chlorobenzene	B073650-BS1	LCS	0.12342	0.12500	mg/kg	98.7		70 - 130		
Chloroethane	B073650-BS1	LCS	0.16128	0.12500	mg/kg	129		70 - 130		
1,4-Dichlorobenzene	B073650-BS1	LCS	0.12245	0.12500	mg/kg	98.0		70 - 130		
1,1-Dichloroethane	B073650-BS1	LCS	0.12178	0.12500	mg/kg	97.4		70 - 130		
1,1-Dichloroethene	B073650-BS1	LCS	0.11731	0.12500	mg/kg	93.8		70 - 130		
Toluene	B073650-BS1	LCS	0.12333	0.12500	mg/kg	98.7		70 - 130		
Trichloroethene	B073650-BS1	LCS	0.11867	0.12500	mg/kg	94.9		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B073650-BS1	LCS	0.050990	0.050000	mg/kg	102		70 - 121		
Toluene-d8 (Surrogate)	B073650-BS1	LCS	0.049600	0.050000	mg/kg	99.2		81 - 117		
4-Bromofluorobenzene (Surrogate)	B073650-BS1	LCS	0.049460	0.050000	mg/kg	98.9		74 - 121		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073650		Used client sample: N									
Benzene	MS	2005481-75	ND	0.14024	0.12500	mg/kg		112		70 - 130	
	MSD	2005481-75	ND	0.14128	0.12500	mg/kg	0.7	113	20	70 - 130	
Bromodichloromethane	MS	2005481-75	ND	0.13293	0.12500	mg/kg		106		70 - 130	
	MSD	2005481-75	ND	0.13894	0.12500	mg/kg	4.4	111	20	70 - 130	
Chlorobenzene	MS	2005481-75	ND	0.12958	0.12500	mg/kg		104		70 - 130	
	MSD	2005481-75	ND	0.13092	0.12500	mg/kg	1.0	105	20	70 - 130	
Chloroethane	MS	2005481-75	ND	0.14217	0.12500	mg/kg		114		70 - 130	
	MSD	2005481-75	ND	0.14551	0.12500	mg/kg	2.3	116	20	70 - 130	
1,4-Dichlorobenzene	MS	2005481-75	ND	0.12745	0.12500	mg/kg		102		70 - 130	
	MSD	2005481-75	ND	0.13281	0.12500	mg/kg	4.1	106	20	70 - 130	
1,1-Dichloroethane	MS	2005481-75	ND	0.13261	0.12500	mg/kg		106		70 - 130	
	MSD	2005481-75	ND	0.13390	0.12500	mg/kg	1.0	107	20	70 - 130	
1,1-Dichloroethene	MS	2005481-75	ND	0.12705	0.12500	mg/kg		102		70 - 130	
	MSD	2005481-75	ND	0.12662	0.12500	mg/kg	0.3	101	20	70 - 130	
Toluene	MS	2005481-75	ND	0.13133	0.12500	mg/kg		105		70 - 130	
	MSD	2005481-75	ND	0.13663	0.12500	mg/kg	4.0	109	20	70 - 130	
Trichloroethene	MS	2005481-75	ND	0.12834	0.12500	mg/kg		103		70 - 130	
	MSD	2005481-75	ND	0.13360	0.12500	mg/kg	4.0	107	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	2005481-75	ND	0.052410	0.050000	mg/kg		105		70 - 121	
	MSD	2005481-75	ND	0.053610	0.050000	mg/kg	2.3	107		70 - 121	
Toluene-d8 (Surrogate)	MS	2005481-75	ND	0.049870	0.050000	mg/kg		99.7		81 - 117	
	MSD	2005481-75	ND	0.050350	0.050000	mg/kg	1.0	101		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	2005481-75	ND	0.047590	0.050000	mg/kg		95.2		74 - 121	
	MSD	2005481-75	ND	0.048740	0.050000	mg/kg	2.4	97.5		74 - 121	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073980						
Acenaphthene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Acenaphthylene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Aldrin	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Aniline	B073980-BLK1	ND	mg/kg	0.20	0.011	
Anthracene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Benzidine	B073980-BLK1	ND	mg/kg	3.0	0.0093	
Benzo[a]anthracene	B073980-BLK1	ND	mg/kg	0.10	0.0077	
Benzo[b]fluoranthene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Benzo[k]fluoranthene	B073980-BLK1	ND	mg/kg	0.10	0.0082	
Benzo[a]pyrene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Benzo[g,h,i]perylene	B073980-BLK1	ND	mg/kg	0.10	0.013	
Benzoic acid	B073980-BLK1	ND	mg/kg	0.50	0.014	
Benzyl alcohol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Benzyl butyl phthalate	B073980-BLK1	ND	mg/kg	0.10	0.0067	
alpha-BHC	B073980-BLK1	ND	mg/kg	0.10	0.0067	
beta-BHC	B073980-BLK1	ND	mg/kg	0.10	0.0075	
delta-BHC	B073980-BLK1	ND	mg/kg	0.10	0.0067	
gamma-BHC (Lindane)	B073980-BLK1	ND	mg/kg	0.10	0.0067	
bis(2-Chloroethoxy)methane	B073980-BLK1	ND	mg/kg	0.10	0.0067	
bis(2-Chloroethyl) ether	B073980-BLK1	ND	mg/kg	0.10	0.0097	
bis(2-Chloroisopropyl)ether	B073980-BLK1	ND	mg/kg	0.10	0.0067	
bis(2-Ethylhexyl)phthalate	B073980-BLK1	ND	mg/kg	0.20	0.0067	
4-Bromophenyl phenyl ether	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4-Chloroaniline	B073980-BLK1	ND	mg/kg	0.10	0.015	
2-Chloronaphthalene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4-Chlorophenyl phenyl ether	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Chrysene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4,4'-DDD	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4,4'-DDE	B073980-BLK1	ND	mg/kg	0.10	0.0068	
4,4'-DDT	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Dibenzo[a,h]anthracene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Dibenzofuran	B073980-BLK1	ND	mg/kg	0.10	0.0067	
1,2-Dichlorobenzene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
1,3-Dichlorobenzene	B073980-BLK1	ND	mg/kg	0.10	0.0067	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073980						
1,4-Dichlorobenzene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
3,3-Dichlorobenzidine	B073980-BLK1	ND	mg/kg	0.20	0.0067	
Dieldrin	B073980-BLK1	ND	mg/kg	0.10	0.0077	
Diethyl phthalate	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Dimethyl phthalate	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Di-n-butyl phthalate	B073980-BLK1	ND	mg/kg	0.10	0.0067	
2,4-Dinitrotoluene	B073980-BLK1	ND	mg/kg	0.10	0.0085	
2,6-Dinitrotoluene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Di-n-octyl phthalate	B073980-BLK1	ND	mg/kg	0.10	0.0067	
1,2-Diphenylhydrazine	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Endosulfan I	B073980-BLK1	ND	mg/kg	0.20	0.0088	
Endosulfan II	B073980-BLK1	ND	mg/kg	0.20	0.0088	
Endosulfan sulfate	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Endrin	B073980-BLK1	ND	mg/kg	0.20	0.0086	
Endrin aldehyde	B073980-BLK1	ND	mg/kg	0.50	0.0070	
Fluoranthene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Fluorene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Heptachlor	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Heptachlor epoxide	B073980-BLK1	ND	mg/kg	0.10	0.013	
Hexachlorobenzene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Hexachlorobutadiene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Hexachlorocyclopentadiene	B073980-BLK1	ND	mg/kg	0.10	0.015	
Hexachloroethane	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Indeno[1,2,3-cd]pyrene	B073980-BLK1	ND	mg/kg	0.10	0.0069	
Isophorone	B073980-BLK1	ND	mg/kg	0.10	0.0067	
2-Methylnaphthalene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Naphthalene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
2-Naphthylamine	B073980-BLK1	ND	mg/kg	3.0	0.036	
2-Nitroaniline	B073980-BLK1	ND	mg/kg	0.10	0.0067	
3-Nitroaniline	B073980-BLK1	ND	mg/kg	0.20	0.0067	
4-Nitroaniline	B073980-BLK1	ND	mg/kg	0.20	0.011	
Nitrobenzene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
N-Nitrosodimethylamine	B073980-BLK1	ND	mg/kg	0.10	0.040	
N-Nitrosodi-N-propylamine	B073980-BLK1	ND	mg/kg	0.10	0.0067	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073980						
N-Nitrosodiphenylamine	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Phenanthrene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
Pyrene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
1,2,4-Trichlorobenzene	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4-Chloro-3-methylphenol	B073980-BLK1	ND	mg/kg	0.20	0.0067	
2-Chlorophenol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
2,4-Dichlorophenol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
2,4-Dimethylphenol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4,6-Dinitro-2-methylphenol	B073980-BLK1	ND	mg/kg	0.50	0.0067	
2,4-Dinitrophenol	B073980-BLK1	ND	mg/kg	0.50	0.0067	
2-Methylphenol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
3- & 4-Methylphenol	B073980-BLK1	ND	mg/kg	0.20	0.014	
2-Nitrophenol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
4-Nitrophenol	B073980-BLK1	ND	mg/kg	0.20	0.018	
Pentachlorophenol	B073980-BLK1	ND	mg/kg	0.20	0.017	
Phenol	B073980-BLK1	ND	mg/kg	0.10	0.0067	
2,4,5-Trichlorophenol	B073980-BLK1	ND	mg/kg	0.20	0.011	
2,4,6-Trichlorophenol	B073980-BLK1	ND	mg/kg	0.20	0.0067	
2-Fluorophenol (Surrogate)	B073980-BLK1	72.5	%	20 - 130 (LCL - UCL)		
Phenol-d5 (Surrogate)	B073980-BLK1	74.2	%	30 - 130 (LCL - UCL)		
Nitrobenzene-d5 (Surrogate)	B073980-BLK1	72.3	%	30 - 130 (LCL - UCL)		
2-Fluorobiphenyl (Surrogate)	B073980-BLK1	81.1	%	30 - 140 (LCL - UCL)		
2,4,6-Tribromophenol (Surrogate)	B073980-BLK1	80.6	%	20 - 150 (LCL - UCL)		
p-Terphenyl-d14 (Surrogate)	B073980-BLK1	73.4	%	30 - 150 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B073980										
Acenaphthene	B073980-BS1	LCS	1.3213	1.6892	mg/kg	78.2		50 - 130		
1,4-Dichlorobenzene	B073980-BS1	LCS	1.5332	1.6892	mg/kg	90.8		50 - 130		
2,4-Dinitrotoluene	B073980-BS1	LCS	1.8008	1.6892	mg/kg	107		50 - 130		
Hexachlorobenzene	B073980-BS1	LCS	1.7342	1.6892	mg/kg	103		40 - 130		
Hexachlorobutadiene	B073980-BS1	LCS	1.5816	1.6892	mg/kg	93.6		50 - 130		
Hexachloroethane	B073980-BS1	LCS	1.5743	1.6892	mg/kg	93.2		50 - 130		
Nitrobenzene	B073980-BS1	LCS	1.7180	1.6892	mg/kg	102		50 - 130		
N-Nitrosodi-N-propylamine	B073980-BS1	LCS	1.3866	1.6892	mg/kg	82.1		40 - 120		
Pyrene	B073980-BS1	LCS	1.4220	1.6892	mg/kg	84.2		40 - 150		
1,2,4-Trichlorobenzene	B073980-BS1	LCS	1.7322	1.6892	mg/kg	103		50 - 120		
4-Chloro-3-methylphenol	B073980-BS1	LCS	1.5852	1.6892	mg/kg	93.8		50 - 130		
2-Chlorophenol	B073980-BS1	LCS	1.2022	1.6892	mg/kg	71.2		50 - 130		
2-Methylphenol	B073980-BS1	LCS	1.3905	1.6892	mg/kg	82.3		50 - 130		
3- & 4-Methylphenol	B073980-BS1	LCS	2.8079	3.3784	mg/kg	83.1		50 - 130		
4-Nitrophenol	B073980-BS1	LCS	1.3452	1.6892	mg/kg	79.6		30 - 130		
Pentachlorophenol	B073980-BS1	LCS	0.96676	1.6892	mg/kg	57.2		20 - 130		
Phenol	B073980-BS1	LCS	1.2647	1.6892	mg/kg	74.9		40 - 120		
2,4,6-Trichlorophenol	B073980-BS1	LCS	1.4713	1.6892	mg/kg	87.1		50 - 130		
2-Fluorophenol (Surrogate)	B073980-BS1	LCS	1.0220	1.3514	mg/kg	75.6		20 - 130		
Phenol-d5 (Surrogate)	B073980-BS1	LCS	1.0982	1.3514	mg/kg	81.3		30 - 130		
Nitrobenzene-d5 (Surrogate)	B073980-BS1	LCS	1.0843	1.3514	mg/kg	80.2		30 - 130		
2-Fluorobiphenyl (Surrogate)	B073980-BS1	LCS	1.1969	1.3514	mg/kg	88.6		30 - 140		
2,4,6-Tribromophenol (Surrogate)	B073980-BS1	LCS	1.0916	1.3514	mg/kg	80.8		20 - 150		
p-Terphenyl-d14 (Surrogate)	B073980-BS1	LCS	0.52675	0.67568	mg/kg	78.0		30 - 150		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073980		Used client sample: N									
Acenaphthene	MS	2008659-01	ND	0.80252	1.6611	mg/kg		48.3		30 - 140	J,A01
	MSD	2008659-01	ND	0.55667	1.6667	mg/kg	36.2	33.4	30	30 - 140	J,A01, Q02
1,4-Dichlorobenzene	MS	2008659-01	ND	0.74990	1.6611	mg/kg		45.1		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.44333	1.6667	mg/kg	51.4	26.6	30	50 - 130	J,A01, Q02, Q03
2,4-Dinitrotoluene	MS	2008659-01	ND	0.61505	1.6611	mg/kg		37.0		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.42667	1.6667	mg/kg	36.2	25.6	30	50 - 130	J,A01, Q02, Q03
Hexachlorobenzene	MS	2008659-01	ND	0.97027	1.6611	mg/kg		58.4		50 - 130	J,A01
	MSD	2008659-01	ND	0.82000	1.6667	mg/kg	16.8	49.2	30	50 - 130	J,A01, Q03
Hexachlorobutadiene	MS	2008659-01	ND	0.87159	1.6611	mg/kg		52.5		50 - 130	J,A01
	MSD	2008659-01	ND	0.68667	1.6667	mg/kg	23.7	41.2	30	50 - 130	J,A01, Q03
Hexachloroethane	MS	2008659-01	ND	0.66767	1.6611	mg/kg		40.2		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.38000	1.6667	mg/kg	54.9	22.8	30	50 - 130	J,A01, Q02, Q03
Nitrobenzene	MS	2008659-01	ND	0.89462	1.6611	mg/kg		53.9		30 - 120	J,A01
	MSD	2008659-01	ND	0.56000	1.6667	mg/kg	46.0	33.6	30	30 - 120	J,A01, Q02
N-Nitrosodi-N-propylamine	MS	2008659-01	ND	0.81239	1.6611	mg/kg		48.9		20 - 130	J,A01
	MSD	2008659-01	ND	0.46333	1.6667	mg/kg	54.7	27.8	30	20 - 130	J,A01, Q02
Pyrene	MS	2008659-01	ND	ND	1.6611	mg/kg		0		40 - 140	A01, Q03
	MSD	2008659-01	ND	ND	1.6667	mg/kg		0	30	40 - 140	A01, Q03
1,2,4-Trichlorobenzene	MS	2008659-01	ND	0.84199	1.6611	mg/kg		50.7		50 - 130	J,A01
	MSD	2008659-01	ND	0.52667	1.6667	mg/kg	46.1	31.6	30	50 - 130	J,A01, Q02, Q03
4-Chloro-3-methylphenol	MS	2008659-01	ND	0.79595	1.6611	mg/kg		47.9		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.52333	1.6667	mg/kg	41.3	31.4	30	50 - 130	J,A01, Q02, Q03

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073980		Used client sample: N									
2-Chlorophenol	MS	2008659-01	ND	0.67425	1.6611	mg/kg		40.6		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.45333	1.6667	mg/kg	39.2	27.2	30	50 - 130	J,A01, Q02,Q03
2-Methylphenol	MS	2008659-01	ND	0.79266	1.6611	mg/kg		47.7		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.58000	1.6667	mg/kg	31.0	34.8	30	50 - 130	J,A01, Q02,Q03
3- & 4-Methylphenol	MS	2008659-01	ND	1.7202	3.3223	mg/kg		51.8		50 - 130	J,A01
	MSD	2008659-01	ND	1.2100	3.3333	mg/kg	34.8	36.3	30	50 - 130	J,A01, Q02,Q03
4-Nitrophenol	MS	2008659-01	ND	1.8320	1.6611	mg/kg		110		30 - 140	J,A01
	MSD	2008659-01	ND	1.7467	1.6667	mg/kg	4.8	105	30	30 - 140	J,A01
Pentachlorophenol	MS	2008659-01	ND	1.1577	1.6611	mg/kg		69.7		30 - 130	J,A01
	MSD	2008659-01	ND	1.0533	1.6667	mg/kg	9.4	63.2	30	30 - 130	J,A01
Phenol	MS	2008659-01	ND	0.75977	1.6611	mg/kg		45.7		40 - 150	J,A01
	MSD	2008659-01	ND	0.55667	1.6667	mg/kg	30.9	33.4	30	40 - 150	J,A01, Q02,Q03
2,4,6-Trichlorophenol	MS	2008659-01	ND	0.78608	1.6611	mg/kg		47.3		50 - 130	J,A01, Q03
	MSD	2008659-01	ND	0.50667	1.6667	mg/kg	43.2	30.4	30	50 - 130	J,A01, Q02,Q03
2-Fluorophenol (Surrogate)	MS	2008659-01	ND	0.56900	1.3289	mg/kg		42.8		20 - 130	A01
	MSD	2008659-01	ND	0.48333	1.3333	mg/kg	16.3	36.3		20 - 130	A01
Phenol-d5 (Surrogate)	MS	2008659-01	ND	0.56900	1.3289	mg/kg		42.8		30 - 130	A01
	MSD	2008659-01	ND	0.50000	1.3333	mg/kg	12.9	37.5		30 - 130	A01
Nitrobenzene-d5 (Surrogate)	MS	2008659-01	ND	0.50980	1.3289	mg/kg		38.4		30 - 130	A01
	MSD	2008659-01	ND	0.37000	1.3333	mg/kg	31.8	27.8		30 - 130	A01,S09
2-Fluorobiphenyl (Surrogate)	MS	2008659-01	ND	0	1.3289	mg/kg		0		30 - 140	A01,S09
	MSD	2008659-01	ND	0	1.3333	mg/kg		0		30 - 140	A01,S09
2,4,6-Tribromophenol (Surrogate)	MS	2008659-01	ND	0.40126	1.3289	mg/kg		30.2		20 - 150	A01
	MSD	2008659-01	ND	0.30667	1.3333	mg/kg	26.7	23.0		20 - 150	A01
p-Terphenyl-d14 (Surrogate)	MS	2008659-01	ND	0.30259	0.66445	mg/kg		45.5		30 - 150	A01
	MSD	2008659-01	ND	0.31333	0.66667	mg/kg	3.5	47.0		30 - 150	A01

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B074123						
Oil and Grease	B074123-BLK1	ND	mg/kg	50	16	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Laboratory Control Sample

								Control Limits		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab Quals
Oil and Grease	QC Batch ID: B074123									
	B074123-BS1	LCS	760.56	788.73	mg/kg	96.4		70 - 130		



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		
									RPD	Percent Recovery	Lab Quals
QC Batch ID: B074123		Used client sample: N									
Oil and Grease	DUP	2009043-05	ND	ND		mg/kg			30		
	MS	2009043-05	ND	739.52	782.44	mg/kg		94.5		70 - 130	
	MSD	2009043-05	ND	793.59	785.57	mg/kg	7.1	101	30	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chemical Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B^C0235						
Total Nitrogen	B^C0235-BLK1	ND	mg/kg	60	20	
QC Batch ID: B073888						
Total Kjeldahl Nitrogen	B073888-BLK1	ND	mg/kg	40	13	
QC Batch ID: B073889						
Total Phosphorus	B073889-BLK1	ND	mg/kg	10	3.2	
QC Batch ID: B074450						
Nitrate as N	B074450-BLK1	ND	mg/kg	1.0	0.26	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chemical Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
QC Batch ID: B073888										
Total Kjeldahl Nitrogen	B073888-BS1	LCS	408.46	400.00	mg/kg	102		90 - 110		
QC Batch ID: B073889										
Total Phosphorus	B073889-BS1	LCS	204.20	200.00	mg/kg	102		85 - 115		
QC Batch ID: B074450										
Nitrate as N	B074450-BS1	LCS	5.1350	5.0000	mg/kg	103		90 - 110		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Chemical Analysis

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073888		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Total Kjeldahl Nitrogen	DUP	2008795-01	196.98	200.70		mg/kg	1.9		20		
	MS	2008795-01	196.98	648.14	400.00	mg/kg		113		90 - 110	Q03
	MSD	2008795-01	196.98	652.84	400.00	mg/kg	0.7	114	20	90 - 110	Q03
QC Batch ID: B073889		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Total Phosphorus	DUP	2008795-01	230.50	229.00		mg/kg	0.7		20		
	MS	2008795-01	230.50	496.50	200.00	mg/kg		133		80 - 120	Q03
	MSD	2008795-01	230.50	488.30	200.00	mg/kg	1.7	129	20	80 - 120	Q03
QC Batch ID: B074450		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Nitrate as N	DUP	2008795-01	1.7600	1.7000		mg/kg	3.5		20		
	MS	2008795-01	1.7600	53.303	50.505	mg/kg		102		80 - 120	
	MSD	2008795-01	1.7600	53.263	50.505	mg/kg	0.1	102	20	80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B073841						
Antimony	B073841-BLK3	ND	mg/kg	0.50	0.080	
Arsenic	B073841-BLK1	ND	mg/kg	0.50	0.17	
Barium	B073841-BLK2	ND	mg/kg	0.25	0.054	
Beryllium	B073841-BLK1	ND	mg/kg	0.25	0.041	
Cadmium	B073841-BLK2	ND	mg/kg	0.25	0.048	
Chromium	B073841-BLK1	ND	mg/kg	0.75	0.25	
Cobalt	B073841-BLK1	ND	mg/kg	0.25	0.049	
Copper	B073841-BLK1	ND	mg/kg	0.50	0.099	
Lead	B073841-BLK1	ND	mg/kg	0.25	0.12	
Molybdenum	B073841-BLK2	ND	mg/kg	0.25	0.045	
Nickel	B073841-BLK1	ND	mg/kg	0.50	0.11	
Selenium	B073841-BLK1	ND	mg/kg	0.50	0.11	
Silver	B073841-BLK1	ND	mg/kg	0.25	0.051	
Thallium	B073841-BLK1	ND	mg/kg	0.25	0.049	
Vanadium	B073841-BLK1	ND	mg/kg	0.75	0.27	
Zinc	B073841-BLK2	0.77800	mg/kg	2.5	0.50	J
QC Batch ID: B073913						
Mercury	B073913-BLK1	0.036800	mg/kg	0.16	0.016	J
QC Batch ID: B073934						
Iron	B073934-BLK2	1.8413	mg/kg	5.0	1.7	J
Magnesium	B073934-BLK1	ND	mg/kg	2.5	1.3	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B073841										
Antimony	B073841-BS3	LCS	10.577	10.000	mg/kg	106		75 - 125		
Arsenic	B073841-BS1	LCS	24.077	25.000	mg/kg	96.3		75 - 125		
Barium	B073841-BS2	LCS	11.200	10.000	mg/kg	112		75 - 125		
Beryllium	B073841-BS1	LCS	10.250	10.000	mg/kg	102		75 - 125		
Cadmium	B073841-BS2	LCS	11.442	10.000	mg/kg	114		75 - 125		
Chromium	B073841-BS1	LCS	10.004	10.000	mg/kg	100		75 - 125		
Cobalt	B073841-BS1	LCS	9.8525	10.000	mg/kg	98.5		75 - 125		
Copper	B073841-BS1	LCS	25.375	25.000	mg/kg	101		75 - 125		
Lead	B073841-BS1	LCS	26.415	25.000	mg/kg	106		75 - 125		
Molybdenum	B073841-BS2	LCS	10.532	10.000	mg/kg	105		75 - 125		
Nickel	B073841-BS1	LCS	24.821	25.000	mg/kg	99.3		75 - 125		
Selenium	B073841-BS1	LCS	25.011	25.000	mg/kg	100		75 - 125		
Silver	B073841-BS1	LCS	9.9592	10.000	mg/kg	99.6		75 - 125		
Thallium	B073841-BS1	LCS	10.391	10.000	mg/kg	104		75 - 125		
Vanadium	B073841-BS1	LCS	9.9022	10.000	mg/kg	99.0		75 - 125		
Zinc	B073841-BS2	LCS	30.289	25.000	mg/kg	121		75 - 125		
QC Batch ID: B073913										
Mercury	B073913-BS1	LCS	0.92320	0.80000	mg/kg	115		80 - 120		
QC Batch ID: B073934										
Iron	B073934-BS2	LCS	516.23	500.00	mg/kg	103		75 - 125		
Magnesium	B073934-BS1	LCS	593.23	500.00	mg/kg	119		75 - 125		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073841		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Antimony	DUP	2008795-01	ND	ND		mg/kg			20		
	MS	2008795-01	ND	2.3330	10.000	mg/kg		23.3		16 - 119	
	MSD	2008795-01	ND	2.4115	10.000	mg/kg	3.3	24.1	20	16 - 119	
Arsenic	DUP	2008795-01	0.59100	0.70400		mg/kg	17.5		20		
	MS	2008795-01	0.59100	24.426	25.000	mg/kg		95.3		75 - 125	
	MSD	2008795-01	0.59100	24.294	25.000	mg/kg	0.5	94.8	20	75 - 125	
Barium	DUP	2008795-01	44.309	44.515		mg/kg	0.5		20		
	MS	2008795-01	44.309	60.419	10.000	mg/kg		161		75 - 125	A03
	MSD	2008795-01	44.309	59.471	10.000	mg/kg	1.6	152	20	75 - 125	A03
Beryllium	DUP	2008795-01	0.065750	0.062250		mg/kg	5.5		20		J
	MS	2008795-01	0.065750	9.7158	10.000	mg/kg		96.5		75 - 125	
	MSD	2008795-01	0.065750	9.6055	10.000	mg/kg	1.1	95.4	20	75 - 125	
Cadmium	DUP	2008795-01	ND	ND		mg/kg			20		
	MS	2008795-01	ND	11.388	10.000	mg/kg		114		75 - 125	
	MSD	2008795-01	ND	11.936	10.000	mg/kg	4.7	119	20	75 - 125	
Chromium	DUP	2008795-01	8.2598	7.5692		mg/kg	8.7		20		
	MS	2008795-01	8.2598	17.439	10.000	mg/kg		91.8		75 - 125	
	MSD	2008795-01	8.2598	18.100	10.000	mg/kg	3.7	98.4	20	75 - 125	
Cobalt	DUP	2008795-01	3.2278	3.2250		mg/kg	0.1		20		
	MS	2008795-01	3.2278	12.140	10.000	mg/kg		89.1		75 - 125	
	MSD	2008795-01	3.2278	12.358	10.000	mg/kg	1.8	91.3	20	75 - 125	
Copper	DUP	2008795-01	7.3202	7.1210		mg/kg	2.8		20		
	MS	2008795-01	7.3202	31.115	25.000	mg/kg		95.2		75 - 125	
	MSD	2008795-01	7.3202	30.364	25.000	mg/kg	2.4	92.2	20	75 - 125	
Lead	DUP	2008795-01	1.7375	1.6540		mg/kg	4.9		20		
	MS	2008795-01	1.7375	25.774	25.000	mg/kg		96.1		75 - 125	
	MSD	2008795-01	1.7375	25.681	25.000	mg/kg	0.4	95.8	20	75 - 125	
Molybdenum	DUP	2008795-01	0.13175	0.13900		mg/kg	5.4		20		J
	MS	2008795-01	0.13175	10.192	10.000	mg/kg		101		75 - 125	
	MSD	2008795-01	0.13175	10.623	10.000	mg/kg	4.1	105	20	75 - 125	
Nickel	DUP	2008795-01	3.1950	3.0865		mg/kg	3.5		20		
	MS	2008795-01	3.1950	25.744	25.000	mg/kg		90.2		75 - 125	
	MSD	2008795-01	3.1950	26.028	25.000	mg/kg	1.1	91.3	20	75 - 125	
Selenium	DUP	2008795-01	ND	ND		mg/kg			20		
	MS	2008795-01	ND	24.964	25.000	mg/kg		99.9		75 - 125	
	MSD	2008795-01	ND	25.047	25.000	mg/kg	0.3	100	20	75 - 125	
Silver	DUP	2008795-01	ND	ND		mg/kg			20		
	MS	2008795-01	ND	9.5780	10.000	mg/kg		95.8		75 - 125	
	MSD	2008795-01	ND	9.6580	10.000	mg/kg	0.8	96.6	20	75 - 125	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

										Control Limits	
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B073841		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Thallium	DUP	2008795-01	0.077750	0.071000		mg/kg	9.1		20		J
	MS	2008795-01	0.077750	9.7742	10.000	mg/kg		97.0		75 - 125	
	MSD	2008795-01	0.077750	9.6398	10.000	mg/kg	1.4	95.6	20	75 - 125	
Vanadium	DUP	2008795-01	28.955	29.455		mg/kg	1.7		20		
	MS	2008795-01	28.955	39.797	10.000	mg/kg		108		75 - 125	
	MSD	2008795-01	28.955	39.756	10.000	mg/kg	0.1	108	20	75 - 125	
Zinc	DUP	2008795-01	18.231	18.728		mg/kg	2.7		20		
	MS	2008795-01	18.231	47.869	25.000	mg/kg		119		75 - 125	
	MSD	2008795-01	18.231	48.966	25.000	mg/kg	2.3	123	20	75 - 125	
QC Batch ID: B073913		Used client sample: N									
Mercury	DUP	2008685-01	0.020000	0.028361		mg/kg	34.6		20		J,A02
	MS	2008685-01	0.020000	0.80000	0.81967	mg/kg		95.2		80 - 120	
	MSD	2008685-01	0.020000	0.85902	0.81967	mg/kg	7.1	102	20	80 - 120	
QC Batch ID: B073934		Used client sample: Y - Description: 2-0.5, 03/20/2020 08:05									
Iron	DUP	2008795-01	10432	11023		mg/kg	5.5		20		
	MS	2008795-01	10432	11697	500.00	mg/kg		253		75 - 125	A03
	MSD	2008795-01	10432	11445	500.00	mg/kg	2.2	202	20	75 - 125	A03
Magnesium	DUP	2008795-01	1997.0	1942.1		mg/kg	2.8		20		
	MS	2008795-01	1997.0	2700.1	500.00	mg/kg		141		75 - 125	Q03
	MSD	2008795-01	1997.0	2795.9	500.00	mg/kg	3.5	160	20	75 - 125	Q03

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



eurofins

Calscience

ANALYTICAL REPORT

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Tel: (714)895-5494

Laboratory Job ID: 570-24361-1
Client Project/Site: 2008795

For:
BC Laboratories
4100 Atlas Court
Bakersfield, California 93308

Attn: Natalie Serda

Authorized for release by:
4/17/2020 2:03:53 PM

Terri Chang, Project Manager I
(714)895-5494
terrichang@eurofinsus.com

The test results in this report meet all 2003 NELAP and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1

2

3

4

5

6

7

8

9

10

11

12

13



Client: BC Laboratories
Project/Site: 2008795

Laboratory Job ID: 570-24361-1

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Detection Summary	4
Client Sample Results	5
QC Sample Results	6
QC Association Summary	7
Lab Chronicle	8
Certification Summary	9
Method Summary	10
Sample Summary	11
Chain of Custody	12
Receipt Checklists	19

1

2

3

4

5

6

7

8

9

10

11

12

13

**Definitions/Glossary**Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
"	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Eurofins Calscience LLC

Page 3 of 19

4/17/2020

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Detection Summary

Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Client Sample ID: 2008795-01

Lab Sample ID: 570-24361-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	520		500	mg/Kg	1		9060A	Total/NA

Client Sample ID: 2008795-02

Lab Sample ID: 570-24361-2

No Detections.

Client Sample ID: 2008795-03

Lab Sample ID: 570-24361-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon, Total Organic	770		500	mg/Kg	1		9060A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC



Client Sample Results

Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

General Chemistry

Client Sample ID: 2008795-01
Date Collected: 03/20/20 08:05
Date Received: 03/26/20 10:30

Lab Sample ID: 570-24361-1
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	520		500	mg/Kg			04/14/20 09:49	1

Client Sample ID: 2008795-02
Date Collected: 03/20/20 08:10
Date Received: 03/26/20 10:30

Lab Sample ID: 570-24361-2
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	ND		500	mg/Kg			04/14/20 09:49	1

Client Sample ID: 2008795-03
Date Collected: 03/20/20 08:20
Date Received: 03/26/20 10:30

Lab Sample ID: 570-24361-3
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	770		500	mg/Kg			04/14/20 09:49	1

Eurofins Calscience LLC

**QC Sample Results**Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Method: 9060A - Organic Carbon, Total (TOC)Lab Sample ID: MB 570-63307/4
Matrix: Solid
Analysis Batch: 63307Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	ND		500	mg/Kg			04/14/20 09:49	1

Lab Sample ID: LCS 570-63307/5
Matrix: Solid
Analysis Batch: 63307Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon, Total Organic	29900	25650		mg/Kg		86	80 - 120

Lab Sample ID: LCSD 570-63307/6
Matrix: Solid
Analysis Batch: 63307Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon, Total Organic	30000	28490		mg/Kg		95	80 - 120	10	20

Lab Sample ID: 570-24722-A-1-B MS
Matrix: Solid
Analysis Batch: 63307Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon, Total Organic	5750		29700	33400		mg/Kg		93	75 - 125

Lab Sample ID: 570-24722-A-1-C MSD
Matrix: Solid
Analysis Batch: 63307Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon, Total Organic	5750		29100	30420		mg/Kg		85	75 - 125	9	25

Method: Moisture - Percent MoistureLab Sample ID: 570-24316-A-1 DU
Matrix: Solid
Analysis Batch: 60128Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	46.6		46.2		%		0.8	10

Eurofins Calscience LLC

QC Association Summary

Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

General Chemistry

Analysis Batch: 60128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-24316-A-1 DU	Duplicate	Total/NA	Solid	Moisture	

Cleanup Batch: 61011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-24722-A-1-B MS	Matrix Spike	Total/NA	Solid	Homogenize Prep	
570-24722-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	Homogenize Prep	

Analysis Batch: 63307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-24361-1	2008795-01	Total/NA	Solid	9060A	
570-24361-2	2008795-02	Total/NA	Solid	9060A	
570-24361-3	2008795-03	Total/NA	Solid	9060A	
MB 570-63307/4	Method Blank	Total/NA	Solid	9060A	
LCS 570-63307/5	Lab Control Sample	Total/NA	Solid	9060A	
LCSD 570-63307/6	Lab Control Sample Dup	Total/NA	Solid	9060A	
570-24722-A-1-B MS	Matrix Spike	Total/NA	Solid	9060A	61011
570-24722-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	9060A	61011

Eurofins Calscience LLC

**Lab Chronicle**Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Client Sample ID: 2008795-01**Lab Sample ID: 570-24361-1****Date Collected: 03/20/20 08:05****Matrix: Solid****Date Received: 03/26/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	206.0 mg	206.0 mg	63307	04/14/20 09:49	CY2M	ECL 1
Instrument ID: TOC10										

Client Sample ID: 2008795-02**Lab Sample ID: 570-24361-2****Date Collected: 03/20/20 08:10****Matrix: Solid****Date Received: 03/26/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	206.3 mg	206.3 mg	63307	04/14/20 09:49	CY2M	ECL 1
Instrument ID: TOC10										

Client Sample ID: 2008795-03**Lab Sample ID: 570-24361-3****Date Collected: 03/20/20 08:20****Matrix: Solid****Date Received: 03/26/20 10:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1	205.9 mg	205.9 mg	63307	04/14/20 09:49	CY2M	ECL 1
Instrument ID: TOC10										

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

ECL 2 = Eurofins Calscience LLC Lampson, 7445 Lampson Ave, Garden Grove, CA 92841, TEL (714)895-5494

Eurofins Calscience LLC



Accreditation/Certification Summary

Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	Los Angeles County Sanitation Districts	10109	09-29-20
California	SCAQMD LAP	17LA0919	11-30-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-20
Nevada	State	CA00111	07-31-20
Oregon	NELAP	CA300001	01-29-21
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-20

Eurofins Calscience LLC



Method Summary

Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Method	Method Description	Protocol	Laboratory
9060A	Organic Carbon, Total (TOC)	SW846	ECL 1
Moisture	Percent Moisture	EPA	ECL 2

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

ECL 2 = Eurofins Calscience LLC Lampson, 7445 Lampson Ave, Garden Grove, CA 92841, TEL (714)895-5494

Eurofins Calscience LLC



Sample Summary

Client: BC Laboratories
Project/Site: 2008795

Job ID: 570-24361-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-24361-1	2008795-01	Solid	03/20/20 08:05	03/26/20 10:30	
570-24361-2	2008795-02	Solid	03/20/20 08:10	03/26/20 10:30	
570-24361-3	2008795-03	Solid	03/20/20 08:20	03/26/20 10:30	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Eurofins Calscience LLC



24361

SUBCONTRACT ORDER

BC Laboratories
2008795

SENDING LABORATORY:

BC Laboratories
4100 Atlas Ct
Bakersfield, CA 93308
Phone: 661-327-4911
Fax: 661-327-1918
Project Manager: Natalie Serda

RECEIVING LABORATORY:

Eurofins Calscience- Garden Grove SCLSCC-EINV
7440 Lincoln Way
Garden Grove, CA 92841-1427
Phone: (714) 895-5494
Fax: (714) 894-7501



570-24361 Chain of Custody

Natalie.Serda@bclabs.com

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 2008795-01	Solids	Sampled:03/20/20 08:05	1	
oi9060s TOC CLSCC	04/06/20 17:00	04/17/20 08:05		
Containers Supplied:				
ja				
Sample ID: 2008795-02	Solids	Sampled:03/20/20 08:10	2	
oi9060s TOC CLSCC	04/06/20 17:00	04/17/20 08:10		
Containers Supplied:				
Sample ID: 2008795-03	Solids	Sampled:03/20/20 08:20	3	
oi9060s TOC CLSCC	04/06/20 17:00	04/17/20 08:20		
Containers Supplied:				

Released By: 2m Date: 3/25/20 Received By: Phen ~ EL Date: 3/26/20 10:30
Released By: _____ Date: _____ Received By: 3-8/2-9 Date: 5/6

Page 1 of 1



Eurofins CalScience LLC

7440 Lincoln Way
Garden Grove, CA 92641
Phone: 714-895-5494 Fax: 714-894-7501

Chain of Custody Record



CalScience

Client Information (Sub Contract Lab)		Lab ID: 570-24361-1		Page: 1 of 1					
Shipping/Receiving		Carrier Tracking No.:		State of Origin: California					
Company: Eurofins Lancaster Laboratories Env LLC		Lab ID: 570-24361-1		Job #: 570-24361-1					
Address: 2425 New Holland Pike, Lancaster, PA, 17601		Due Date Requested: 4/15/2020		Analysis Requested:					
Phone: 717-858-2300 (Tel)		TAT Requested (days):		Preservation Codes:					
Email:		PO #:		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHCO3 F - NaOH G - Na2SO3 H - Acetic Acid I - TSP Dodecylate J - DI Water K - EDTA L - EDA M - Hexane N - None O - AHA02 P - Na2CO3 Q - NaHCO3 R - NaOH S - Na2SO3 T - TSP Dodecylate U - Acetone V - MCA W - pH 4-5 X - other (specify)					
Project Name: 2008795		Project #:		Other:					
Site:		SSC/WE:							
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C-Comp, G-grab)	Matrix (W-wet, S-solid, O-Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Organic Carbon	Total Number of Containers	Special Instructions/Note:
2008795-01 (570-24361-1)	3/20/20	08:05 Pacific	Solid	Solid	X	X		1	Please watch Holding Time!
2008795-02 (570-24361-2)	3/20/20	08:10 Pacific	Solid	Solid	X	X		1	Please watch Holding Time!
2008795-03 (570-24361-3)	3/20/20	08:20 Pacific	Solid	Solid	X	X		1	Please watch Holding Time!
Note: Since laboratory accreditations are subject to change, Eurofins CalScience places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analytes/substances being analyzed, the samples must be shipped back to the Eurofins CalScience laboratory or other instructions will be provided. Any change to accreditation status should be brought to Eurofins CalScience attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody document to use compliance to Eurofins CalScience.									
Possible Hazard Identification									
Unconfirmed									
Deliverable Requested: I, II, III, IV, Other (specify)									
Primary Deliverable Rank: 2									
Sample Disposal (A few may be assessed if samples are retained longer than 1 month)									
Return To Client									
Disposal By Lab									
Archive For									
Months									
Special Instructions/QC Requirements:									
Empty Kit Being Issued by:									
Date/Time: 04/08/2020 16:30									
Received by: Company									
Date/Time: Company									
Received by: Company									
Date/Time: Company									
Received by: Company									
Date/Time: Company									
Cooler Temperature (°C) and Other Remarks:									
Custody Seal Infract: Yes No									

Ver: 01/16/2019

ORIGIN ID: APVA (714) 895-5464
 NOEL CRUISE
 EUROFINS CALSCIENCE, INC.
 7440 LINCOLN WAY
 GARDEN GROVE, CA 92641
 UNITED STATES US

SHIP DATE: 08APR20
 ACTWGT: 18.00 LB
 CAD: 1533735INET4220

BILL SENDER

TO SAMPLE RECEIVING
 EUROFINS LANCASTER
 2425 NEW HOLLAND PIKE
 LANCASTER PA 17601
 (717) 656-2300
 NY: PO: DEPT.

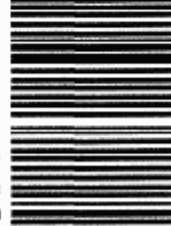
LANCASTER PA 17601
 REF: TC24361

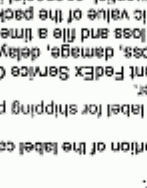
THU - 09 APR 3:00P
 STANDARD OVERNIGHT

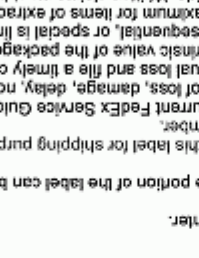
TRK# 7702 0010 0633
 0201

17601
 MDT
 PA-JS

XH LNSA







DEPT.

58J3G25FE4A

Page 15 of 19

FedEx Ship Manager - Print Your Label(s)

4/8/2020

4/17/2020



24361

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13



570-24361 Waybill

FROM
MOLLY MEYERS-BC LABORATORIES, INC
4100 ATLAS CT

BAKERSFIELD CA 93308
SHIP TO
TERRI CHANG
EUROFINS - CALSCIENCE
7440 LINCOLN WAY

Package 1 of 1
47057

GLS
PDS
S92841A

GARDEN GROVE CA 92841



17768308

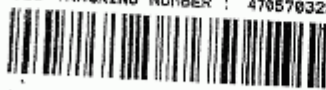
ORC CA927-CL0

C.O.D. : 0.00 Wgt: 8
Ref. # :

Sig. Type: STANDARD

GLS TRACKING NUMBER
47057032520371825820

GLS TRACKING NUMBER : 47057032520371825820



03/25/20 10:36 AM C



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Subcontract Report for 2008795 PDF File Name: WO_2008795_SUB_CLSCC.pdf Page 18 of 19

24361

Do Not Lift Using This Tag

570-24361 Waybill

ORIGIN TO: LNSA (717) 558-8501
SHIPPING DEPARTMENT
EUROFINS LANCASTER LABS, INC.
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601
UNITED STATES US

SHIP DATE: 10APR20
ACTWT: 17.30 LB
CAD: 614137/CAFE3311
DIMS: 15x12x11 IN
BILL RECIPIENT

TO **SAMPLE RECEIVING**
EUROFINS CALSCIENCE, LLC
7440 LINCOLN WAY
GARDEN GROVE CA 92841

(714) 885-5494 REF: SEP11

FedEx Express

SA

TRK# 1036 8598 7611
0201

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO APVA

92841
CA-US SNA

RT 138
ST 19

3 12:00 B
7611
04.11

Page 18 of 19

4/17/2020

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

**Login Sample Receipt Checklist**

Client: BC Laboratories

Job Number: 570-24361-1

Login Number: 24361

List Source: Eurofins Calscience

List Number: 1

Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins Calscience LLC

Page 19 of 19

4/17/2020

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/17/2020 14:40
Project: Cottonwood
Project Number: S020.1016
Project Manager: Sarah Battelle

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A01	Detection and quantitation limits are raised due to sample dilution.
A02	The difference between duplicate readings is less than the quantitation limit.
A03	The sample concentration was more than 4 times the spike level.
A07	Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
A20	Surrogate is low due to matrix interference. Interference verified through second extraction/analysis.
Q02	Matrix spike precision is not within the control limits.
Q03	Matrix spike recovery(s) was(were) not within the control limits.
S09	The surrogate recovery for this compound was not within the control limits.
V01	The Initial Calibration Verification (ICV) recovery is not within established control limits.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

**GROUNDWATER MONITORING PROGRAM
SURFACE WATER DATA SHEET**

Site Name: Cottonwood Golf Project No.: SO20.1016

Station I.D.: Up Sampling Date: 4/10/20
Collected By: KW Sampling Time: 14:30
Horiba Model S/N: San Diego Duplicate Sample: YES ☒ NO

COLOR	ODOR	pH	CONDUCTIVITY ms/cm	TURBIDITY NTU	D.O. mg/L	TEMPERATURE °C	O.R.P. mV
Clear	No	6.88	3.71	20	8.72	14.79	163

Surface water conditions (including stream flow rate, stream depth):

Up to about 1-2 feet deep. Mostly laminar flow. Stream less than 10 feet wide at sample location.

Additional Info/Comments:

**GROUNDWATER MONITORING PROGRAM
SURFACE WATER DATA SHEET**

Site Name: Cottonwood Golf Project No.: SO20.1016

Station I.D.: Mid Sampling Date: 4/10/20
Collected By: KW Sampling Time: 13:30
Horiba Model S/N: San Diego Duplicate Sample: YES ☒

COLOR	ODOR	pH	CONDUCTIVITY ms/cm	TURBIDITY NTU	D.O. mg/L	TEMPERATURE °C	O.R.P. mV
Brown	No	6.38	4.64	>800	10.00	14.75	191

Surface water conditions (including stream flow rate, stream depth):

Up to about 3-4 feet deep. Turbid flow. Stream about 40+ feet wide at sample location.

Additional Info/Comments:

**GROUNDWATER MONITORING PROGRAM
SURFACE WATER DATA SHEET**

Site Name: Cottonwood Golf Project No.: SO20.1016

Station I.D.: Down Sampling Date: 4/14/20
Collected By: KW Sampling Time: 10:45
Horiba Model S/N: San Diego Duplicate Sample: YES ☒

COLOR	ODOR	pH	CONDUCTIVITY ms/cm	TURBIDITY NTU	D.O. mg/L	TEMPERATURE °C	O.R.P. mV
Clear	No	6.70	1.10	6.0	7.56	19.07	165

Surface water conditions (including stream flow rate, stream depth):

Up to about 1 foot deep. Clear, mostly laminar flow. Stream pretty wide at sample location (about 80').

Additional Info/Comments:



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 04/21/2020

Sarah Battelle

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200

San Diego, CA 92127

Client Project: Cottonwood Sand Mine Project

BCL Project: Bacteriological

BCL Work Order: 2010717

Invoice ID: B377714

Enclosed are the results of analyses for samples received by the laboratory on 4/13/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda

Client Service Rep

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Report ID: 1001020871

4100 Atlas Court Bakersfield, CA 93308 (661) 327-4911 FAX (661) 327-1918 www.bclabs.com

Page 1 of 8



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	3
Laboratory / Client Sample Cross Reference.....	5

Bacteriological Sample Results

2010717-01 - UP	
Water Analysis (Bacteriological).....	6
2010717-02 - MID	
Water Analysis (Bacteriological).....	7

Notes

Notes and Definitions.....	8
----------------------------	---



Geologic
San Diego

Bact 20-10717

Kyle Welchans

COTTONWOOD SAND MINE PROJECT

Sample Container Order
Apr-20

Sample Description	Matrix	TOC	Total Phosphorus as P	Oil & Grease	MBAS	TSS	TDS	Nitrate-N, Nitrite-N, Total Nitrogen as N	Total Coliform and E. Coli (SM9223B)	VOCs (EPA 524.2)	Title 22 Metals (including iron and manganese)	Chloride, Sulfate	Organochlorine Pesticides (508)	Chlorinated Herbicides (515.1)	SVOCs (525.2M)	Notes
Ivanhoe #11	GW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
Lake #11	GW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
SW Up	SW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
SW Mid	SW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
SW Down	SW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
East Boring*	soil	X											X	X	X	
Mid Boring*	Soil	X											X	X	X	
West Boring*	Soil	X											X	X	X	
Trip Blanks*	W														X	
EXTRA	GW	X				X	X	X	X	X	X	X	X	X	X	
EXTRA	Soil	X											X	X	X	

Notes:

JN: SO20.1016

(1) Measure pH, DO, Electrical Conductivity, Temperature and Turbidity in field
EXTRA sample containers are for backup only and do not represent a sample point.
*Soil samples to be collected in stainless steel sample tubes. Provide 12 jars for any grab samples we may collect.

SAMPLE CONTAINER ORDER CHECKLIST
(C:\BottleOrder w added analytes.xlsx)4/13/2020

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/21/2020 9:08
Project: Bacteriological
Project Number: Cottonwood Sand Mine Project
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2010717-01	COC Number:	---	Receive Date:	04/13/2020 08:14
	Project Number:	---	Sampling Date:	04/10/2020 14:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	UP	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
2010717-02	COC Number:	---	Receive Date:	04/13/2020 08:14
	Project Number:	---	Sampling Date:	04/10/2020 13:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MID	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/21/2020 9:08
Project: Bacteriological
Project Number: Cottonwood Sand Mine Project
Project Manager: Sarah Battelle

2010717-01

Water Analysis (Bacteriological)

COC Number:	---	District ID:	
Project Number:	---	System Number:	
Sampling Location:	---	Station Number:	
Sampling Point:	UP	Sample Site:	
Sampled By:	---	Residual Chlorine, ppm:	
Receive Date:	04/13/2020 08:14	Temperature, C:	
Sampling Date:	04/10/2020 14:30		
Sample Depth:	---		
Sample Matrix:	Water		

Colilert (Quantitray)

Constituent	Result	Units	Method	Analyst	Initial Dilution	Date Started	Date Completed	Lab Quals
Total Coliform, Confirmed Test	97	Positive Wells	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	
Total Coliform, Density	>2400	MPN/100ml	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	A26,S05
E. Coli, Confirmed Test	95	Positive Wells	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	
E. Coli, Density	2000	MPN/100ml	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	A26,S05

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/21/2020 9:08
Project: Bacteriological
Project Number: Cottonwood Sand Mine Project
Project Manager: Sarah Battelle

2010717-02

Water Analysis (Bacteriological)

COC Number:	---	District ID:	
Project Number:	---	System Number:	
Sampling Location:	---	Station Number:	
Sampling Point:	MID	Sample Site:	
Sampled By:	---	Residual Chlorine, ppm:	
Receive Date:	04/13/2020 08:14	Temperature, C:	
Sampling Date:	04/10/2020 13:30		
Sample Depth:	---		
Sample Matrix:	Water		

Colilert (Quantitray)

Constituent	Result	Units	Method	Analyst	Initial Dilution	Date Started	Date Completed	Lab Quals
Total Coliform, Confirmed Test	97	Positive Wells	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	
Total Coliform, Density	>2400	MPN/100ml	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	A26,S05
E. Coli, Confirmed Test	89	Positive Wells	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	
E. Coli, Density	1100	MPN/100ml	SM-9223B	FBV	1	04/13/2020 12:30	04/14/2020	A26,S05

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/21/2020 9:08
Project: Bacteriological
Project Number: Cottonwood Sand Mine Project
Project Manager: Sarah Battelle

Notes And Definitions

MPN Most Probable Number
A26 Sample received past holding time.
S05 The sample holding time was exceeded.

EnviroMatrix



Analytical, Inc.

10 June 2020

Geo-Logic Associates

EMA Log #: 20D0429

Attn: Sarah Battelle

16885 W. Bernardo Drive, Suite 305

San Diego, CA 92127

Project: COTTONWOOD/S020.1016

Enclosed are the results of analyses for samples received by the laboratory on 04/14/20 12:45. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that this data is in compliance both technically and for completeness.

A handwritten signature in black ink that reads "Leland S. Pitt".

Leland S. Pitt

Laboratory Director

CA ELAP Certification #: 2564

4340 Viewridge Avenue, Suite A - San Diego, California 92123 - (858) 560-7717 - Fax (858) 560-7763
Analytical Chemistry Laboratory

Client Name: Geo-Logic Associates
Project Name: COTTONWOOD/S020.1016

EMA Log #: 20D0429

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
UP	20D0429-01	Water	04/14/20 11:30	04/14/20 12:45
MID	20D0429-02	Water	04/14/20 11:15	04/14/20 12:45
DOWN	20D0429-03	Water	04/14/20 10:45	04/14/20 12:45

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix



Analytical, Inc.

Client Name: Geo-Logic Associates
Project Name: COTTONWOOD/S020.1016

EMA Log #: 20D0429

Conventional Chemistry Parameters by Standard/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Analyst	Batch	Sample Prepared Sample Analyzed	Method	Notes
UP (20D0429-01) Water Sampled: 04/14/20 11:30 Received: 04/14/20 12:45										
Nitrate as N	0.30	0.02	0.10	mg/l	2	UM	0041651	04/17/20 12:54 04/17/20 14:26	EPA 353.2	W-02
Nitrite as N	0.009	0.007	0.05	"	1	UM	0042059	04/15/20 18:00 04/15/20 18:00	SM4500 NO2 B	J
MID (20D0429-02) Water Sampled: 04/14/20 11:15 Received: 04/14/20 12:45										
Nitrate as N	0.40	0.02	0.10	mg/l	2	UM	0041651	04/17/20 12:54 04/17/20 14:26	EPA 353.2	W-02
Nitrite as N	0.01	0.007	0.05	"	1	UM	0042059	04/15/20 18:00 04/15/20 18:00	SM4500 NO2 B	J
DOWN (20D0429-03) Water Sampled: 04/14/20 10:45 Received: 04/14/20 12:45										
Nitrate as N	0.38	0.02	0.10	mg/l	2	UM	0041651	04/17/20 12:54 04/17/20 14:26	EPA 353.2	W-02
Nitrite as N	0.008	0.007	0.05	"	1	UM	0042059	04/15/20 18:00 04/15/20 18:00	SM4500 NO2 B	J

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix



Analytical, Inc.

Client Name: Geo-Logic Associates
Project Name: COTTONWOOD/S020.1016

EMA Log #: 20D0429

Microbiological Parameters by Standard Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Analyst	Batch	Sample Prepared Sample Analyzed	Method	Notes
UP (20D0429-01) Water Sampled: 04/14/20 11:30 Received: 04/14/20 12:45										
Total Coliforms	>24200	1	1	MPN/10 0 ml	1	AER	0041453	04/14/20 16:00 04/15/20 16:00	SM9223	
Total Coliforms	>24200	1	1	MPN/10 0 ml	1	AER	0041453	04/14/20 16:00 04/15/20 16:00	SM9223	
E. Coli	548	1	1	"	"	AER	"	04/14/20 16:00 04/15/20 16:00	"	
MID (20D0429-02) Water Sampled: 04/14/20 11:15 Received: 04/14/20 12:45										
Total Coliforms	>24200	1	1	MPN/10 0 ml	1	AER	0041453	04/14/20 16:00 04/15/20 16:00	SM9223	
Total Coliforms	>24200	1	1	MPN/10 0 ml	1	AER	0041453	04/14/20 16:00 04/15/20 16:00	SM9223	
E. Coli	194	1	1	"	"	AER	"	04/14/20 16:00 04/15/20 16:00	"	
DOWN (20D0429-03) Water Sampled: 04/14/20 10:45 Received: 04/14/20 12:45										
Total Coliforms	>24200	1	1	MPN/10 0 ml	1	AER	0041453	04/14/20 16:00 04/15/20 16:00	SM9223	
Total Coliforms	>24200	1	1	MPN/10 0 ml	1	AER	0041453	04/14/20 16:00 04/15/20 16:00	SM9223	
E. Coli	201	1	1	"	"	AER	"	04/14/20 16:00 04/15/20 16:00	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix



Analytical, Inc.

Client Name: Geo-Logic Associates
Project Name: COTTONWOOD/S020.1016

EMA Log #: 20D0429

Conventional Chemistry Parameters by Standard/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Analyst	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0041651												
Blank (0041651-BLK1)						Prepared & Analyzed: 04/17/20						
Nitrate as N	0.01	0.009	0.05	mg/l	UM							J
LCS (0041651-BS1)						Prepared & Analyzed: 04/17/20						
Nitrate as N	0.49	0.009	0.05	mg/l	UM	0.500		98	90-110			
LCS Dup (0041651-BSD1)						Prepared & Analyzed: 04/17/20						
Nitrate as N	0.49	0.009	0.05	mg/l	UM	0.500		98	90-110	0.2	20	
Duplicate (0041651-DUP1)						Source: 20D0177-04		Prepared & Analyzed: 04/17/20				
Nitrate as N	ND	0.009	0.05	mg/l	UM		ND				20	
Matrix Spike (0041651-MS1)						Source: 20D0177-04		Prepared & Analyzed: 04/17/20				
Nitrate as N	0.98	0.02	0.10	mg/l	UM	1.00	ND	98	90-110			
Matrix Spike Dup (0041651-MSD1)						Source: 20D0177-04		Prepared & Analyzed: 04/17/20				
Nitrate as N	0.99	0.02	0.10	mg/l	UM	1.00	ND	99	90-110	0.4	20	
Batch 0042059												
Blank (0042059-BLK1)						Prepared & Analyzed: 04/15/20						
Nitrite as N	ND	0.007	0.05	mg/l	UM							
LCS (0042059-BS1)						Prepared & Analyzed: 04/15/20						
Nitrite as N	0.10	0.007	0.05	mg/l	UM	0.100		102	80-120			
LCS Dup (0042059-BSD1)						Prepared & Analyzed: 04/15/20						
Nitrite as N	0.10	0.007	0.05	mg/l	UM	0.100		102	80-120	0	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix



Analytical, Inc.

Client Name: Geo-Logic Associates
Project Name: COTTONWOOD/S020.1016

EMA Log #: 20D0429

Conventional Chemistry Parameters by Standard/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Analyst	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	---------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 0042059

Duplicate (0042059-DUP1)

Source: 20D0420-02

Prepared & Analyzed: 04/15/20

Nitrite as N	ND	0.007	0.05	mg/l	UM		ND				20	
--------------	----	-------	------	------	----	--	----	--	--	--	----	--

Matrix Spike (0042059-MS1)

Source: 20D0420-02

Prepared & Analyzed: 04/15/20

Nitrite as N	0.10	0.007	0.05	mg/l	UM	0.100	ND	97	80-120			
--------------	------	-------	------	------	----	-------	----	----	--------	--	--	--

Matrix Spike Dup (0042059-MSD1)

Source: 20D0420-02

Prepared & Analyzed: 04/15/20

Nitrite as N	0.10	0.007	0.05	mg/l	UM	0.100	ND	97	80-120	0	20	
--------------	------	-------	------	------	----	-------	----	----	--------	---	----	--

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix



Analytical, Inc.

Client Name: Geo-Logic Associates
Project Name: COTTONWOOD/S020.1016

EMA Log #: 20D0429

Notes and Definitions

W-02	The sample for nitrate analysis was preserved with H ₂ SO ₄ after the nitrite portion of the analysis was completed to extend the holding time for the sample. Nitrate results are corrected for the nitrite contribution per the method.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
A-05a	>24200
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis (if indicated in units column)
RPD	Relative Percent Difference
MDL	Method detection limit (indicated per client's request)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix



Analytical, Inc.

4340 Viewridge Ave., Ste. A - San Diego, CA 92123 - Phone (858) 560-7717 - Fax (858) 560-7763

EMA LOG #:					
Client: G60-0091C KSCNATES					
Attn: KRAIG BATELL					
Samplers(s): K. WELCHANS					
Address: 11415 WEST BURNED CREEK #200					
Phone: 358-451-1136					
Email: SRATELE@G60-0091C.COM					
Billing Address:					
Project ID: 010101010					
Project #: 0020-1010					
PO #:					
ID #	Client Sample ID	Sample Date	Sample Time	Sample Matrix	Container # / Type
1	UP	4-14-00	1130	W	3
2	MID				
3	DOWN				
4					
5					
6					
7					
8					
9					
10					

Matrix Codes A = Air, DW = Drinking Water, GW = Groundwater, SW = Storm Water
 WW = Wastewater, S = Soil, SED = Sediment, SD = Solid, T = Tissue, O = Oil, L = Liquid

Shipped By: ☐ Courier ☐ UPS ☒ FedEx ☐ USPS ☐ Client Drop Off ☐ Other

Turn-Around-Time: ☐ Same Day ☐ 1 day ☐ 2 day ☐ 3 day ☐ 4 day ☐ 5 day ☒ 7-10 business days

Reporting Requirements: ☐ Fax ☒ EDI ☐ Excel ☐ Geotracker/EDF ☐ Hard Copy ☐ EDT ☐ CEDEN ☐ SDWIS

Sample Disposal: ☒ B) Laboratory ☐ Return to Client ☐ P/U or Delivery ☐ Archive

Sample Integrity	
Correct Containers: ☒ No N/A	Containers Properly Preserved: ☒ Yes No N/A
Custody Seals Intact: Yes No N/A	Temp @ Receipt: ☒ 4°C ☐ 10°C ☐ 15°C ☐ 20°C
COC/Labels Agree: ☒ Yes No N/A	Sampled By: ☒ Client EMA Autosampler

Project/Sample Location/Address:

Project/Sample Comments:

Client is aware not all NBAS can be run, start with
Down Sample #3. - And 4/14/20

Additional costs may apply. Please note there is a \$35 minimum charge for all clients.

CLIVA reserves the right to return any samples that do not match our waste profile.

NOTE: By relinquishing samples to EMA, Inc., client agrees to pay for the services requested on this COC form 30 days after report has been finalized unless otherwise noted. All work is subject to EMA's terms and conditions.

ice. Samples will be disposed of 7



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 04/30/2020

Sarah Battelle

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Client Project: S020.1016
BCL Project: Cottonwood Sand Mine Project
BCL Work Order: 2010716
Invoice ID: B378800

Enclosed are the results of analyses for samples received by the laboratory on 4/13/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	3
Laboratory / Client Sample Cross Reference.....	7

Sample Results

2010716-01 - UP

Organochlorine Pesticides and PCB's (EPA Method 508).....	8
Organic Analysis (EPA Method 515.1).....	9
Volatile Organic Analysis (EPA Method 524.2).....	10
Organic Analysis by Liquid Solids Extraction (EPA Method 525.2).....	13
EPA Method 1664.....	15
Water Analysis (General Chemistry).....	16
Metals Analysis.....	17

2010716-02 - MID

Organochlorine Pesticides and PCB's (EPA Method 508).....	18
Organic Analysis (EPA Method 515.1).....	19
Volatile Organic Analysis (EPA Method 524.2).....	20
Organic Analysis by Liquid Solids Extraction (EPA Method 525.2).....	23
EPA Method 1664.....	25
Water Analysis (General Chemistry).....	26
Metals Analysis.....	27

Quality Control Reports

Organochlorine Pesticides and PCB's (EPA Method 508)

Method Blank Analysis.....	28
Laboratory Control Sample.....	29
Precision and Accuracy.....	30

Organic Analysis (EPA Method 515.1)

Method Blank Analysis.....	31
Laboratory Control Sample.....	32
Precision and Accuracy.....	33

Volatile Organic Analysis (EPA Method 524.2)

Method Blank Analysis.....	34
Laboratory Control Sample.....	37
Precision and Accuracy.....	38

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Method Blank Analysis.....	39
Laboratory Control Sample.....	41
Precision and Accuracy.....	42

EPA Method 1664

Method Blank Analysis.....	43
Laboratory Control Sample.....	44
Precision and Accuracy.....	45

Water Analysis (General Chemistry)

Method Blank Analysis.....	46
Laboratory Control Sample.....	47
Precision and Accuracy.....	48

Metals Analysis

Method Blank Analysis.....	49
Laboratory Control Sample.....	50
Precision and Accuracy.....	51

Notes

Notes and Definitions.....	53
----------------------------	----

CHAIN OF CUSTODY

Geo-Logic
ASSOCIATES

20-10-16

PROJECT INFORMATION				ANALYSES			
PROJECT NAME:	COTTONWOOD			JOB#	5020.1016		
BILLING NUMBER:	5020.1016						
PROJECT MANAGER:	SARAH GATHE						
LABORATORY:	BC						
SHIPMENT METHOD:	UPS						
TURN AROUND TIME:	24 hr. 48 hr. <u>NORMAL</u>						
DISPOSAL:	1 lb Disposal (A) Return () Pick Up ()						
SAMPLER'S SIGNATURE:							
SAMPLE ID.	LAB ID.	DATE	TIME	MATRIX			
UP -1		4/10/20	1430	W			
MID -2		4/10/20	1330	W			
CHK BY  SUB OUT ☐							
1. RELINQUISHED BY:  DATE 4/10/20 TIME 1700 SIGNATURE:  PRINTED NAME: SARAH GATHE COMPANY: BC				2. RELINQUISHED BY:  DATE 4/10/20 TIME 1700 SIGNATURE:  PRINTED NAME: SARAH GATHE COMPANY: BC			
3. RECEIVED BY:  DATE 4-13-20 TIME 814 SIGNATURE:  PRINTED NAME: SARAH GATHE COMPANY: BC				3. RECEIVED BY:  DATE 4-13-20 TIME 814 SIGNATURE:  PRINTED NAME: SARAH GATHE COMPANY: BC			
PROJECT MANAGER'S SIGNATURE:  DATE 4/10/20 TIME 1700 SIGNATURE:  PRINTED NAME: SARAH GATHE COMPANY: BC				PROJECT MANAGER'S SIGNATURE:  DATE 4/10/20 TIME 1700 SIGNATURE:  PRINTED NAME: SARAH GATHE COMPANY: BC			

2250 W. 1st Street, Suite 228, Claremont, CA 91711 Phone: (909) 626-2282 Fax: (909) 626-1233

(MISC:CHAIN;6-1-92)



Geologic
San Diego

Bact 20-10717

Kyle Welchans
20-10716

COTTONWOOD SAND MINE PROJECT

Sample Container Order

Apr-20

Sample Description	Matrix	TOC	Total Phosphorus as P	Oil & Grease	MBAS	TSS	TDS	Nitrate-N, Nitrite-N, Total Nitrogen as N	Total Coliform and E. Coli (SM9223B)	VOCs (EPA 524.2)	Title 22 Metals (including Iron and manganese)	Chloride, Sulfate	Organochlorine Pesticides (508)	Chlorinated Herbicides (515.1)	SVOCs (525.2M)	Notes
Ivanhoe #11	GW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
Lake #11	GW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
SW Up	SW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
SW Mid	SW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
SW Down	SW		X	X	X	X	X	X	X	X	X	X	X	X	X	1
East Boring*	soil	X											X	X	X	
Mid Boring*	Soil	X											X	X	X	
West Boring*	Soil	X											X	X	X	
Trip Blanks*	W														X	
EXTRA	GW	X				X	X	X	X	X	X	X	X	X	X	
EXTRA	Soil	X											X	X	X	

Notes:

JN: SO20.1016

(1) Measure pH, DO, Electrical Conductivity, Temperature and Turbidity in field
EXTRA sample containers are for backup only and do not represent a sample point.
*Soil samples to be collected in stainless steel sample tubes. Provide 12 jars for any grab samples we may collect.

SAMPLE CONTAINER ORDER CHECKLIST
(C:\BottleOrder w added analytes.xlsx)4/13/2020



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2010716 Page 3 of 4

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 of 2							
Submission #: 20-10716											
SHIPPING INFORMATION			SHIPPING CONTAINER		FREE LIQUID						
Fed Ex ☐	UPS ☒	Ontrac ☐ Hand Delivery ☐	Ice Chest ☒ None ☐ Box ☐	YES ☐ NO ☐							
BC Lab Field Service ☐ Other ☐ (Specify) _____			Other ☐ (Specify) _____		W / S						
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: ice melted											
Custody Seals: Ice Chest ☐ Containers ☐ None ☒ Comments: _____											
Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐											
All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☐ No ☐ Description(s) match COC? Yes ☒ No ☐											
COC Received		Emissivity: 91	Container: PE	Thermometer ID: 714	Date/Time: 4/13/20						
☒ YES ☐ NO		Temperature: (A) 10.2 °C / (C) 10.1 °C	c 49		Analyst Init: TK						
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES		2-3									
4oz / 8oz / 16oz PE UNPRES											
2oz Cr ⁶⁺											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz		144									
PT CYANIDE											
PT NITROGEN FORMS											
PT TOTAL SULFIDE											
2oz. NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON											
PT CHEMICAL OXYGEN DEMAND											
PTA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL											
QT EPA 1664											
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40 ml VOA VIAL- 504											
QT EPA 508/608/8080											
QT EPA 515.1/8150											
QT EPA 525											
QT EPA 525 TRAVEL BLANK											
40ml EPA 547											
40ml EPA 531.1											
8oz EPA 548											
QT EPA 549											
QT EPA 8015M											
QT EPA 8270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOIL SLEEVE											
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments:

Sample Numbering Completed By: JFW

- Actual / C = Corrected

Date/Time: 4-13-20 9:50

Rev 21 05/23/2016

IS:WPDoc\Wat\Perfect\LAB_DOC\FORMS\SAMRECrev 201

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2010716 Page 4 of 4

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 2 of 2						
Submission #: 20-10716										
* SHIPPING INFORMATION Fed Ex ☐ UPS ☒ Ontrac ☐ Hand Delivery ☐ BC Lab Field Service ☐ Other ☐ (Specify) _____		SHIPPING CONTAINER Ice Chest ☒ None ☐ Box ☐ Other ☐ (Specify) _____		FREE LIQUID YES ☐ NO ☐ W / S						
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: ice melted										
Custody Seals: Ice Chest ☐ Containers ☐ None ☒ Comments: _____ Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐										
All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐										
COC Received YES ☒ NO ☐		Emissivity: 97 Container: PE Thermometer ID: 274 413/20 c 8/8		Date/Time: 4-13-20 8:14 Analyst Init: TIK						
Temperature: (A) 11.5 °C / (C) 11.4 °C										
SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT PE UNPRES	N-Q									
4oz / 8oz / 16oz PE UNPRES										
2oz Cr ⁶⁺										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz	ES									
PT CYANIDE										
PT NITROGEN FORMS	T									
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON	U									
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	A-M									
QT EPA 1664	V									
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 505/508/509										
QT EPA 515.1/515										
QT EPA 525										
QT EPA 525 TRAVEL BLANK	0662									
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 5015M										
QT EPA 5270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments: _____
Sample Numbering Completed By: JTC Date/Time: 4-13-20 9:50
A = Actual / C = Corrected

Rev 21 05/23/2016
IS:\WPDoc\WordPerfect\LAB_S01\FORMS\SAMRECrev 201

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2010716-01	COC Number:	---	Receive Date:	04/13/2020 08:14
	Project Number:	---	Sampling Date:	04/10/2020 14:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	UP	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
2010716-02	COC Number:	---	Receive Date:	04/13/2020 08:14
	Project Number:	---	Sampling Date:	04/10/2020 13:30
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	MID	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM							
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #	
Aldrin	ND	ug/L	0.0050	0.0026	EPA-508	ND		1	
alpha-BHC	ND	ug/L	0.0050	0.0032	EPA-508	ND		1	
beta-BHC	ND	ug/L	0.0050	0.0020	EPA-508	ND		1	
delta-BHC	ND	ug/L	0.0050	0.0021	EPA-508	ND		1	
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.0020	EPA-508	ND		1	
Chlordane (Technical)	ND	ug/L	0.10	0.036	EPA-508	ND		1	
4,4'-DDD	ND	ug/L	0.0050	0.0023	EPA-508	ND		1	
4,4'-DDE	ND	ug/L	0.0050	0.0022	EPA-508	ND		1	
4,4'-DDT	ND	ug/L	0.0050	0.0038	EPA-508	ND		1	
Dieldrin	ND	ug/L	0.0050	0.0013	EPA-508	ND		1	
Endosulfan I	ND	ug/L	0.0050	0.0016	EPA-508	ND		1	
Endosulfan II	ND	ug/L	0.0050	0.0027	EPA-508	ND		1	
Endosulfan sulfate	ND	ug/L	0.0050	0.0040	EPA-508	ND		1	
Endrin	ND	ug/L	0.0050	0.0020	EPA-508	ND		1	
Endrin aldehyde	ND	ug/L	0.010	0.0021	EPA-508	ND		1	
Heptachlor	ND	ug/L	0.0050	0.0019	EPA-508	ND		1	
Heptachlor epoxide	ND	ug/L	0.0050	0.0014	EPA-508	ND		1	
Methoxychlor	ND	ug/L	0.0050	0.0030	EPA-508	ND		1	
Toxaphene	ND	ug/L	1.0	0.050	EPA-508	ND		1	
PCB-1016	ND	ug/L	0.20	0.066	EPA-508	ND		1	
PCB-1221	ND	ug/L	0.20	0.063	EPA-508	ND		1	
PCB-1232	ND	ug/L	0.20	0.059	EPA-508	ND		1	
PCB-1242	ND	ug/L	0.20	0.037	EPA-508	ND		1	
PCB-1248	ND	ug/L	0.20	0.044	EPA-508	ND		1	
PCB-1254	ND	ug/L	0.20	0.037	EPA-508	ND		1	
PCB-1260	ND	ug/L	0.20	0.089	EPA-508	ND		1	
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-508	ND		1	
TCMX (Surrogate)	59.8	%	60 - 130 (LCL - UCL)		EPA-508		A20	1	
Decachlorobiphenyl (Surrogate)	38.8	%	60 - 130 (LCL - UCL)		EPA-508		A20	1	

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-508	04/16/20 14:15	04/17/20 15:10		HKS	GC-17	1	B075742	EPA 508

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bentazon	ND	ug/L	0.80	0.22	EPA-515.1	ND		1
2,4-D	ND	ug/L	0.40	0.18	EPA-515.1	ND		1
2,4-DB	ND	ug/L	3.0	0.37	EPA-515.1	ND		1
Dalapon	ND	ug/L	5.0	0.31	EPA-515.1	ND		1
Dicamba	ND	ug/L	0.080	0.040	EPA-515.1	ND		1
Dichloroprop	ND	ug/L	0.50	0.11	EPA-515.1	ND		1
Dinoseb	ND	ug/L	0.20	0.057	EPA-515.1	ND		1
MCPA	ND	ug/L	10	6.0	EPA-515.1	ND		1
MCPP	ND	ug/L	10	6.0	EPA-515.1	ND		1
2,4,5-T	ND	ug/L	0.090	0.012	EPA-515.1	ND		1
2,4,5-TP (Silvex)	ND	ug/L	0.070	0.032	EPA-515.1	ND		1
2,4-Dichlorophenylacetic acid (Surrogate)	88.0	%	40 - 120 (LCL - UCL)		EPA-515.1			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-515.1	04/15/20 10:00	04/18/20 04:51	OLH	GC-8	1	B075911	EPA 515.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2010716-01	Client Sample Name:	UP, 4/10/2020 2:30:00PM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	103	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	98.4	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	101	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	04/14/20 06:10	04/14/20 13:27	MGC	MS-V5	1	B075334	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthylene	ND	ug/L	0.10	0.031	EPA-525.2	ND		1
Alachlor	ND	ug/L	0.20	0.090	EPA-525.2	ND		1
Anthracene	ND	ug/L	0.10	0.034	EPA-525.2	ND		1
Atraton	ND	ug/L	0.50	0.057	EPA-525.2	ND		1
Atrazine	ND	ug/L	0.30	0.14	EPA-525.2	ND		1
Benzo[a]anthracene	ND	ug/L	0.20	0.044	EPA-525.2	ND		1
Benzo[b]fluoranthene	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Benzo[k]fluoranthene	ND	ug/L	0.30	0.072	EPA-525.2	ND		1
Benzo[a]pyrene	ND	ug/L	0.10	0.050	EPA-525.2	ND		1
Benzo[g,h,i]perylene	ND	ug/L	0.30	0.065	EPA-525.2	ND		1
Benzyl butyl phthalate	ND	ug/L	4.0	0.047	EPA-525.2	ND		1
delta-BHC	ND	ug/L	0.20	0.048	EPA-525.2	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.20	0.063	EPA-525.2	ND		1
bis(2-Ethylhexyl)phthalate	ND	ug/L	3.0	0.030	EPA-525.2	ND		1
Bromacil	ND	ug/L	0.50	0.043	EPA-525.2	ND		1
Chrysene	ND	ug/L	0.30	0.060	EPA-525.2	ND		1
Diazinon	ND	ug/L	0.20	0.080	EPA-525.2	ND		1
Dibenzo[a,h]anthracene	ND	ug/L	0.30	0.051	EPA-525.2	ND		1
Di(2-ethylhexyl)adipate	ND	ug/L	1.0	0.025	EPA-525.2	ND		1
Dimethoate	ND	ug/L	2.0	0.050	EPA-525.2	ND		1
Dimethyl phthalate	ND	ug/L	1.0	0.034	EPA-525.2	ND		1
Di-n-butyl phthalate	ND	ug/L	1.0	0.063	EPA-525.2	ND		1
Fluorene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorobenzene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorocyclopentadiene	ND	ug/L	1.0	0.12	EPA-525.2	ND		1
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.30	0.032	EPA-525.2	ND		1
Methoxychlor	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Metolachlor	ND	ug/L	0.50	0.056	EPA-525.2	ND		1
Metribuzin	ND	ug/L	0.50	0.048	EPA-525.2	ND		1
Molinate	ND	ug/L	0.50	0.036	EPA-525.2	ND		1
Phenanthrene	ND	ug/L	0.10	0.020	EPA-525.2	ND		1
Prometon	ND	ug/L	0.50	0.11	EPA-525.2	ND		1
Prometryn	ND	ug/L	0.50	0.045	EPA-525.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Pyrene	ND	ug/L	0.10	0.040	EPA-525.2	ND		1
Secbumeton	ND	ug/L	0.50	0.079	EPA-525.2	ND		1
Simazine	ND	ug/L	0.30	0.066	EPA-525.2	ND		1
Terbutryn	ND	ug/L	0.50	0.050	EPA-525.2	ND		1
Thiobencarb	ND	ug/L	0.50	0.044	EPA-525.2	ND		1
Perylene-d12 (Surrogate)	59.0	%	60 - 140 (LCL - UCL)		EPA-525.2		S09	1
1,3-Dimethyl-2-nitrobenzene (Surrogate)	47.4	%	70 - 130 (LCL - UCL)		EPA-525.2		S09	1
Triphenylphosphate (Surrogate)	128	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Pyrene-d10 (Surrogate)	97.2	%	70 - 130 (LCL - UCL)		EPA-525.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-525.2	04/20/20 07:30	04/23/20 09:04	MK	MS-B6	1	B076114	EPA 525.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/L	5.0	0.66	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-1664A HEM	04/17/20 12:00	04/20/20 15:16		MAM	MAN-SV	1	B075919	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

BCL Sample ID:	2010716-01	Client Sample Name:	UP, 4/10/2020 2:30:00PM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Chloride	50	mg/L	0.50	0.13	EPA-300.0	ND		1
Nitrate as N	0.25	mg/L	0.10	0.024	EPA-300.0	ND	A26,S05	1
Sulfate	47	mg/L	1.0	0.14	EPA-300.0	ND		1
Total Dissolved Solids @ 180 C	350	mg/L	20	10	EPA-160.1	ND	A07	2
Total Suspended Solids (Glass Fiber)	14	mg/L	0.56	0.56	EPA-160.2	ND	A07	3
MBAS	ND	mg/L	0.10	0.025	EPA-425.1	ND	A26,S05	4
Total Nitrogen	0.97	mg/L	0.30	0.10	Calc	ND		5
Total Kjeldahl Nitrogen	0.73	mg/L	0.20	0.067	EPA-351.2	ND		6
Nitrite as N	ND	ug/L	50	10	EPA-353.2	ND	A26,S05	7
Total Phosphorus	0.12	mg/L	0.050	0.017	EPA-365.4	ND		8
Non-Volatile Organic Carbon	8.2	mg/L	1.0	0.30	EPA-415.1	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-300.0	04/13/20 16:00	04/13/20 17:48	CMM	IC7	1	B075354	No Prep
2	EPA-160.1	04/16/20 16:00	04/16/20 16:00	CAD	MANUAL	2	B075627	No Prep
3	EPA-160.2	04/14/20 09:00	04/14/20 09:00	OJP	MANUAL	1.111	B075436	No Prep
4	EPA-425.1	04/15/20 07:30	04/15/20 07:30	JMN	SPEC06	1	B075548	No Prep
5	Calc	04/13/20 15:01	04/29/20 17:01	AMM	Calc	1	B^D0141	Calc
6	EPA-351.2	04/27/20 08:45	04/28/20 14:45	JMH2	SC-2	1	B076461	EPA 351.2
7	EPA-353.2	04/14/20 08:49	04/14/20 08:49	MC1	KONE-1	1	B075605	No Prep
8	EPA-365.4	04/27/20 08:45	04/29/20 10:13	JMH2	SC-2	1	B076462	EPA 365.4
9	EPA-415.1	04/15/20 07:00	04/16/20 08:11	ALW	TOC2	1	B075339	No Prep

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

BCL Sample ID: 2010716-01		Client Sample Name: UP, 4/10/2020 2:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Antimony	0.36	ug/L	2.0	0.11	EPA-200.8	ND	J	1
Total Recoverable Arsenic	ND	ug/L	2.0	0.70	EPA-200.8	ND		1
Total Recoverable Barium	32	ug/L	1.0	0.21	EPA-200.8	0.22		1
Total Recoverable Beryllium	ND	ug/L	1.0	0.14	EPA-200.8	ND		1
Total Recoverable Cadmium	ND	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Chromium	0.92	ug/L	3.0	0.50	EPA-200.8	ND	J	1
Total Recoverable Cobalt	0.71	ug/L	1.0	0.10	EPA-200.8	ND	J	1
Total Recoverable Copper	5.7	ug/L	2.0	0.22	EPA-200.8	0.39		1
Total Recoverable Iron	800	ug/L	50	30	EPA-200.7	ND		2
Total Recoverable Lead	0.66	ug/L	1.0	0.10	EPA-200.8	ND	J	1
Total Recoverable Manganese	140	ug/L	10	4.0	EPA-200.7	ND		2
Total Recoverable Mercury	0.035	ug/L	0.20	0.022	EPA-245.1	ND	J	3
Total Recoverable Molybdenum	2.3	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Nickel	1.8	ug/L	2.0	0.19	EPA-200.8	0.45	J	1
Total Recoverable Selenium	ND	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Silver	ND	ug/L	1.0	0.10	EPA-200.8	ND		4
Total Recoverable Thallium	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Vanadium	9.6	ug/L	3.0	0.78	EPA-200.8	ND		1
Total Recoverable Zinc	16	ug/L	10	1.7	EPA-200.8	2.5		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-200.8	04/15/20 12:15	04/15/20 18:32	AS1	PE-EL4	1	B075555	EPA 200.2
2	EPA-200.7	04/13/20 16:40	04/14/20 18:08	JRG	PE-OP4	1	B075327	EPA 200.2
3	EPA-245.1	04/16/20 09:00	04/16/20 12:38	TMT	CETAC3	1	B075618	EPA 245.1
4	EPA-200.8	04/16/20 09:30	04/16/20 14:37	AS1	PE-EL2	1	B075654	EPA 200.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ug/L	0.0050	0.0026	EPA-508	ND		1
alpha-BHC	ND	ug/L	0.0050	0.0032	EPA-508	ND		1
beta-BHC	ND	ug/L	0.0050	0.0020	EPA-508	ND		1
delta-BHC	ND	ug/L	0.0050	0.0021	EPA-508	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.0020	EPA-508	ND		1
Chlordane (Technical)	ND	ug/L	0.10	0.036	EPA-508	ND		1
4,4'-DDD	ND	ug/L	0.0050	0.0023	EPA-508	ND		1
4,4'-DDE	ND	ug/L	0.0050	0.0022	EPA-508	ND		1
4,4'-DDT	ND	ug/L	0.0050	0.0038	EPA-508	ND		1
Dieldrin	ND	ug/L	0.0050	0.0013	EPA-508	ND		1
Endosulfan I	ND	ug/L	0.0050	0.0016	EPA-508	ND		1
Endosulfan II	ND	ug/L	0.0050	0.0027	EPA-508	ND		1
Endosulfan sulfate	ND	ug/L	0.0050	0.0040	EPA-508	ND		1
Endrin	ND	ug/L	0.0050	0.0020	EPA-508	ND		1
Endrin aldehyde	ND	ug/L	0.010	0.0021	EPA-508	ND		1
Heptachlor	ND	ug/L	0.0050	0.0019	EPA-508	ND		1
Heptachlor epoxide	ND	ug/L	0.0050	0.0014	EPA-508	ND		1
Methoxychlor	ND	ug/L	0.0050	0.0030	EPA-508	ND		1
Toxaphene	ND	ug/L	1.0	0.050	EPA-508	ND		1
PCB-1016	ND	ug/L	0.20	0.066	EPA-508	ND		1
PCB-1221	ND	ug/L	0.20	0.063	EPA-508	ND		1
PCB-1232	ND	ug/L	0.20	0.059	EPA-508	ND		1
PCB-1242	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1248	ND	ug/L	0.20	0.044	EPA-508	ND		1
PCB-1254	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1260	ND	ug/L	0.20	0.089	EPA-508	ND		1
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-508	ND		1
TCMX (Surrogate)	27.9	%	60 - 130 (LCL - UCL)		EPA-508		A20	1
Decachlorobiphenyl (Surrogate)	27.2	%	60 - 130 (LCL - UCL)		EPA-508		A20	1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-508	04/16/20 14:15	04/17/20 15:26		HKS	GC-17	1	B075742	EPA 508

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bentazon	ND	ug/L	0.80	0.22	EPA-515.1	ND		1
2,4-D	ND	ug/L	0.40	0.18	EPA-515.1	ND		1
2,4-DB	ND	ug/L	3.0	0.37	EPA-515.1	ND		1
Dalapon	ND	ug/L	5.0	0.31	EPA-515.1	ND		1
Dicamba	ND	ug/L	0.080	0.040	EPA-515.1	ND		1
Dichloroprop	ND	ug/L	0.50	0.11	EPA-515.1	ND		1
Dinoseb	ND	ug/L	0.20	0.057	EPA-515.1	ND		1
MCPA	ND	ug/L	10	6.0	EPA-515.1	ND		1
MCPP	ND	ug/L	10	6.0	EPA-515.1	ND		1
2,4,5-T	ND	ug/L	0.090	0.012	EPA-515.1	ND		1
2,4,5-TP (Silvex)	ND	ug/L	0.070	0.032	EPA-515.1	ND		1
2,4-Dichlorophenylacetic acid (Surrogate)	42.8	%	40 - 120 (LCL - UCL)		EPA-515.1			1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-515.1	04/15/20 10:00	04/18/20 05:14		OLH	GC-8	1	B075911	EPA 515.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2010716-02	Client Sample Name:	MID, 4/10/2020 1:30:00PM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	104	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	98.6	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	101	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	04/14/20 06:10	04/14/20 13:51	MGC	MS-V5	1	B075334	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthylene	ND	ug/L	0.10	0.031	EPA-525.2	ND		1
Alachlor	ND	ug/L	0.20	0.090	EPA-525.2	ND		1
Anthracene	ND	ug/L	0.10	0.034	EPA-525.2	ND		1
Atraton	ND	ug/L	0.50	0.057	EPA-525.2	ND		1
Atrazine	ND	ug/L	0.30	0.14	EPA-525.2	ND		1
Benzo[a]anthracene	ND	ug/L	0.20	0.044	EPA-525.2	ND		1
Benzo[b]fluoranthene	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Benzo[k]fluoranthene	ND	ug/L	0.30	0.072	EPA-525.2	ND		1
Benzo[a]pyrene	ND	ug/L	0.10	0.050	EPA-525.2	ND		1
Benzo[g,h,i]perylene	ND	ug/L	0.30	0.065	EPA-525.2	ND		1
Benzyl butyl phthalate	ND	ug/L	4.0	0.047	EPA-525.2	ND		1
delta-BHC	ND	ug/L	0.20	0.048	EPA-525.2	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.20	0.063	EPA-525.2	ND		1
bis(2-Ethylhexyl)phthalate	ND	ug/L	3.0	0.030	EPA-525.2	ND		1
Bromacil	ND	ug/L	0.50	0.043	EPA-525.2	ND		1
Chrysene	ND	ug/L	0.30	0.060	EPA-525.2	ND		1
Diazinon	ND	ug/L	0.20	0.080	EPA-525.2	ND		1
Dibenzo[a,h]anthracene	ND	ug/L	0.30	0.051	EPA-525.2	ND		1
Di(2-ethylhexyl)adipate	ND	ug/L	1.0	0.025	EPA-525.2	ND		1
Dimethoate	ND	ug/L	2.0	0.050	EPA-525.2	ND		1
Dimethyl phthalate	ND	ug/L	1.0	0.034	EPA-525.2	ND		1
Di-n-butyl phthalate	ND	ug/L	1.0	0.063	EPA-525.2	ND		1
Fluorene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorobenzene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorocyclopentadiene	ND	ug/L	1.0	0.12	EPA-525.2	ND		1
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.30	0.032	EPA-525.2	ND		1
Methoxychlor	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Metolachlor	ND	ug/L	0.50	0.056	EPA-525.2	ND		1
Metribuzin	ND	ug/L	0.50	0.048	EPA-525.2	ND		1
Molinate	ND	ug/L	0.50	0.036	EPA-525.2	ND		1
Phenanthrene	ND	ug/L	0.10	0.020	EPA-525.2	ND		1
Prometon	ND	ug/L	0.50	0.11	EPA-525.2	ND		1
Prometryn	ND	ug/L	0.50	0.045	EPA-525.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Pyrene	ND	ug/L	0.10	0.040	EPA-525.2	ND		1
Secbumeton	ND	ug/L	0.50	0.079	EPA-525.2	ND		1
Simazine	ND	ug/L	0.30	0.066	EPA-525.2	ND		1
Terbutryn	ND	ug/L	0.50	0.050	EPA-525.2	ND		1
Thiobencarb	ND	ug/L	0.50	0.044	EPA-525.2	ND		1
Perylene-d12 (Surrogate)	62.6	%	60 - 140 (LCL - UCL)		EPA-525.2			1
1,3-Dimethyl-2-nitrobenzene (Surrogate)	49.4	%	70 - 130 (LCL - UCL)		EPA-525.2		S09	1
Triphenylphosphate (Surrogate)	141	%	70 - 130 (LCL - UCL)		EPA-525.2		S09	1
Pyrene-d10 (Surrogate)	88.2	%	70 - 130 (LCL - UCL)		EPA-525.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-525.2	04/20/20 07:30	04/23/20 09:31	MK	MS-B6	1	B076114	EPA 525.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

BCL Sample ID:	2010716-02	Client Sample Name:	MID, 4/10/2020 1:30:00PM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/L	5.0	0.66	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-1664A HEM	04/17/20 12:00	04/20/20 15:16		MAM	MAN-SV	1	B075919	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

BCL Sample ID:	2010716-02	Client Sample Name:	MID, 4/10/2020 1:30:00PM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Chloride	28	mg/L	0.50	0.13	EPA-300.0	ND		1
Nitrate as N	0.99	mg/L	0.10	0.024	EPA-300.0	ND	A26,S05	1
Sulfate	21	mg/L	1.0	0.14	EPA-300.0	ND		1
Total Dissolved Solids @ 180 C	280	mg/L	20	10	EPA-160.1	ND	A07	2
Total Suspended Solids (Glass Fiber)	2400	mg/L	23	23	EPA-160.2	ND	A07	3
MBAS	ND	mg/L	0.10	0.025	EPA-425.1	ND	A26,S05	4
Total Nitrogen	5.1	mg/L	0.30	0.10	Calc	ND		5
Total Kjeldahl Nitrogen	4.1	mg/L	0.20	0.067	EPA-351.2	ND		6
Nitrite as N	ND	ug/L	50	10	EPA-353.2	ND	A26,S05	7
Total Phosphorus	1.0	mg/L	0.050	0.017	EPA-365.4	ND		8
Non-Volatile Organic Carbon	33	mg/L	5.0	1.5	EPA-415.1	ND	A07	9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-300.0	04/13/20 16:00	04/13/20 19:00	CMM	IC7	1	B075354	No Prep
2	EPA-160.1	04/16/20 16:00	04/16/20 16:00	CAD	MANUAL	2	B075627	No Prep
3	EPA-160.2	04/14/20 09:00	04/14/20 09:00	OJP	MANUAL	45.455	B075436	No Prep
4	EPA-425.1	04/15/20 07:30	04/15/20 07:30	JMN	SPEC06	1	B075548	No Prep
5	Calc	04/13/20 15:01	04/29/20 17:01	AMM	Calc	1	B^D0141	Calc
6	EPA-351.2	04/27/20 08:45	04/28/20 14:46	JMH2	SC-2	1	B076461	EPA 351.2
7	EPA-353.2	04/14/20 08:49	04/14/20 08:49	MC1	KONE-1	1	B075605	No Prep
8	EPA-365.4	04/27/20 08:45	04/29/20 10:13	JMH2	SC-2	1	B076462	EPA 365.4
9	EPA-415.1	04/15/20 07:00	04/16/20 08:26	ALW	TOC2	5	B075339	No Prep

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

BCL Sample ID: 2010716-02		Client Sample Name: MID, 4/10/2020 1:30:00PM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Antimony	0.24	ug/L	4.0	0.22	EPA-200.8	ND	J,A07	1
Total Recoverable Arsenic	3.3	ug/L	4.0	1.4	EPA-200.8	ND	J,A07	1
Total Recoverable Barium	270	ug/L	2.0	0.42	EPA-200.8	0.43	A07	1
Total Recoverable Beryllium	0.65	ug/L	2.0	0.28	EPA-200.8	ND	J,A07	1
Total Recoverable Cadmium	0.44	ug/L	2.0	0.22	EPA-200.8	ND	J,A07	1
Total Recoverable Chromium	32	ug/L	6.0	1.0	EPA-200.8	ND	A07	1
Total Recoverable Cobalt	26	ug/L	2.0	0.20	EPA-200.8	ND	A07	1
Total Recoverable Copper	85	ug/L	4.0	0.44	EPA-200.8	0.78	A07	1
Total Recoverable Iron	21000	ug/L	50	30	EPA-200.7	ND		2
Total Recoverable Lead	23	ug/L	2.0	0.20	EPA-200.8	ND	A07	1
Total Recoverable Manganese	910	ug/L	10	4.0	EPA-200.7	ND		2
Total Recoverable Mercury	ND	ug/L	0.20	0.022	EPA-245.1	ND		3
Total Recoverable Molybdenum	0.77	ug/L	2.0	0.22	EPA-200.8	ND	J,A07	1
Total Recoverable Nickel	24	ug/L	4.0	0.38	EPA-200.8	0.90	A07	1
Total Recoverable Selenium	ND	ug/L	4.0	0.38	EPA-200.8	ND	A07	1
Total Recoverable Silver	ND	ug/L	2.0	0.20	EPA-200.8	ND	A07	4
Total Recoverable Thallium	0.50	ug/L	2.0	0.20	EPA-200.8	ND	J,A07	1
Total Recoverable Vanadium	120	ug/L	6.0	1.6	EPA-200.8	ND	A07	1
Total Recoverable Zinc	170	ug/L	20	3.4	EPA-200.8	5.1	A07	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-200.8	04/15/20 12:15	04/15/20 18:34	AS1	PE-EL4	2	B075555	EPA 200.2
2	EPA-200.7	04/13/20 16:40	04/14/20 18:11	JRG	PE-OP4	1	B075327	EPA 200.2
3	EPA-245.1	04/16/20 09:00	04/16/20 12:40	TMT	CETAC3	1	B075618	EPA 245.1
4	EPA-200.8	04/16/20 09:30	04/16/20 14:39	AS1	PE-EL2	2	B075654	EPA 200.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075742						
Aldrin	B075742-BLK1	ND	ug/L	0.0050	0.0026	
alpha-BHC	B075742-BLK1	ND	ug/L	0.0050	0.0032	
beta-BHC	B075742-BLK1	ND	ug/L	0.0050	0.0020	
delta-BHC	B075742-BLK1	ND	ug/L	0.0050	0.0021	
gamma-BHC (Lindane)	B075742-BLK1	ND	ug/L	0.0050	0.0020	
Chlordane (Technical)	B075742-BLK1	ND	ug/L	0.10	0.036	
4,4'-DDD	B075742-BLK1	ND	ug/L	0.0050	0.0023	
4,4'-DDE	B075742-BLK1	ND	ug/L	0.0050	0.0022	
4,4'-DDT	B075742-BLK1	ND	ug/L	0.0050	0.0038	
Dieldrin	B075742-BLK1	ND	ug/L	0.0050	0.0013	
Endosulfan I	B075742-BLK1	ND	ug/L	0.0050	0.0016	
Endosulfan II	B075742-BLK1	ND	ug/L	0.0050	0.0027	
Endosulfan sulfate	B075742-BLK1	ND	ug/L	0.0050	0.0040	
Endrin	B075742-BLK1	ND	ug/L	0.0050	0.0020	
Endrin aldehyde	B075742-BLK1	ND	ug/L	0.010	0.0021	
Heptachlor	B075742-BLK1	ND	ug/L	0.0050	0.0019	
Heptachlor epoxide	B075742-BLK1	ND	ug/L	0.0050	0.0014	
Methoxychlor	B075742-BLK1	ND	ug/L	0.0050	0.0030	
Toxaphene	B075742-BLK1	ND	ug/L	1.0	0.050	
PCB-1016	B075742-BLK1	ND	ug/L	0.20	0.066	
PCB-1221	B075742-BLK1	ND	ug/L	0.20	0.063	
PCB-1232	B075742-BLK1	ND	ug/L	0.20	0.059	
PCB-1242	B075742-BLK1	ND	ug/L	0.20	0.037	
PCB-1248	B075742-BLK1	ND	ug/L	0.20	0.044	
PCB-1254	B075742-BLK1	ND	ug/L	0.20	0.037	
PCB-1260	B075742-BLK1	ND	ug/L	0.20	0.089	
Total PCB's (Summation)	B075742-BLK1	ND	ug/L	0.20	0.10	
TCMX (Surrogate)	B075742-BLK1	90.5	%	60 - 130 (LCL - UCL)		
Decachlorobiphenyl (Surrogate)	B075742-BLK1	78.2	%	60 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075742										
Aldrin	B075742-BS1	LCS	0.14967	0.15000	ug/L	99.8		60 - 130		
gamma-BHC (Lindane)	B075742-BS1	LCS	0.19290	0.15000	ug/L	129		60 - 130		
4,4'-DDT	B075742-BS1	LCS	0.15165	0.15000	ug/L	101		60 - 130		
Dieldrin	B075742-BS1	LCS	0.15733	0.15000	ug/L	105		60 - 130		
Endrin	B075742-BS1	LCS	0.18935	0.15000	ug/L	126		60 - 130		
Heptachlor	B075742-BS1	LCS	0.16195	0.15000	ug/L	108		60 - 130		
TCMX (Surrogate)	B075742-BS1	LCS	0.29059	0.30000	ug/L	96.9		60 - 130		
Decachlorobiphenyl (Surrogate)	B075742-BS1	LCS	0.40066	0.60000	ug/L	66.8		60 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075742		Used client sample: N									
Aldrin	MS	2009671-12	ND	0.15032	0.15000	ug/L		100		60 - 130	
	MSD	2009671-12	ND	0.15091	0.15000	ug/L	0.4	101	30	60 - 130	
gamma-BHC (Lindane)	MS	2009671-12	ND	0.19447	0.15000	ug/L		130		60 - 130	
	MSD	2009671-12	ND	0.19402	0.15000	ug/L	0.2	129	30	60 - 130	
4,4'-DDT	MS	2009671-12	ND	0.15097	0.15000	ug/L		101		60 - 130	
	MSD	2009671-12	ND	0.15167	0.15000	ug/L	0.5	101	30	60 - 130	
Dieldrin	MS	2009671-12	ND	0.15498	0.15000	ug/L		103		60 - 130	
	MSD	2009671-12	ND	0.15382	0.15000	ug/L	0.8	103	30	60 - 130	
Endrin	MS	2009671-12	ND	0.18795	0.15000	ug/L		125		60 - 130	
	MSD	2009671-12	ND	0.18988	0.15000	ug/L	1.0	127	30	60 - 130	
Heptachlor	MS	2009671-12	ND	0.16080	0.15000	ug/L		107		60 - 130	
	MSD	2009671-12	ND	0.16132	0.15000	ug/L	0.3	108	30	60 - 130	
TCMX (Surrogate)	MS	2009671-12	ND	0.29451	0.30000	ug/L		98.2		60 - 130	
	MSD	2009671-12	ND	0.30105	0.30000	ug/L	2.2	100		60 - 130	
Decachlorobiphenyl (Surrogate)	MS	2009671-12	ND	0.39531	0.60000	ug/L		65.9		60 - 130	
	MSD	2009671-12	ND	0.39924	0.60000	ug/L	1.0	66.5		60 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075911						
Bentazon	B075911-BLK1	ND	ug/L	0.80	0.22	
2,4-D	B075911-BLK1	ND	ug/L	0.40	0.18	
2,4-DB	B075911-BLK1	ND	ug/L	3.0	0.37	
Dalapon	B075911-BLK1	ND	ug/L	5.0	0.31	
Dicamba	B075911-BLK1	ND	ug/L	0.080	0.040	
Dichloroprop	B075911-BLK1	ND	ug/L	0.50	0.11	
Dinoseb	B075911-BLK1	ND	ug/L	0.20	0.057	
MCPA	B075911-BLK1	ND	ug/L	10	6.0	
MCPP	B075911-BLK1	ND	ug/L	10	6.0	
2,4,5-T	B075911-BLK1	ND	ug/L	0.090	0.012	
2,4,5-TP (Silvex)	B075911-BLK1	ND	ug/L	0.070	0.032	
2,4-Dichlorophenylacetic acid (Surrogate)	B075911-BLK1	91.8	%	40 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075911										
2,4-D	B075911-BS1	LCS	1.7400	2.4000	ug/L	72.5		50 - 120		
2,4-DB	B075911-BS1	LCS	3.9300	5.4000	ug/L	72.8		50 - 120		
Dicamba	B075911-BS1	LCS	0.40000	0.60000	ug/L	66.7		50 - 120		
Dichloroprop	B075911-BS1	LCS	1.6900	2.4000	ug/L	70.4		50 - 120		
Dinoseb	B075911-BS1	LCS	0.64000	1.2000	ug/L	53.3		50 - 120		
2,4,5-T	B075911-BS1	LCS	0.25000	0.60000	ug/L	41.7		40 - 120		
2,4,5-TP (Silvex)	B075911-BS1	LCS	0.36000	0.60000	ug/L	60.0		50 - 120		
2,4-Dichlorophenylacetic acid (Surrogate)	B075911-BS1	LCS	3.1200	4.0000	ug/L	78.0		40 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: B075911		Used client sample: N									
2,4-D	MS	2009671-14	ND	1.8800	2.4000	ug/L		78.3		40 - 120	
	MSD	2009671-14	ND	1.7900	2.4000	ug/L	4.9	74.6	30	40 - 120	
2,4-DB	MS	2009671-14	ND	4.3400	5.4000	ug/L		80.4		50 - 120	
	MSD	2009671-14	ND	4.0600	5.4000	ug/L	6.7	75.2	30	50 - 120	
Dicamba	MS	2009671-14	ND	0.44000	0.60000	ug/L		73.3		50 - 120	
	MSD	2009671-14	ND	0.40000	0.60000	ug/L	9.5	66.7	30	50 - 120	
Dichloroprop	MS	2009671-14	ND	1.9400	2.4000	ug/L		80.8		40 - 120	
	MSD	2009671-14	ND	1.7600	2.4000	ug/L	9.7	73.3	30	40 - 120	
Dinoseb	MS	2009671-14	ND	0.76000	1.2000	ug/L		63.3		40 - 130	
	MSD	2009671-14	ND	0.69000	1.2000	ug/L	9.7	57.5	30	40 - 130	
2,4,5-T	MS	2009671-14	ND	0.29000	0.60000	ug/L		48.3		40 - 120	
	MSD	2009671-14	ND	0.28000	0.60000	ug/L	3.5	46.7	30	40 - 120	
2,4,5-TP (Silvex)	MS	2009671-14	ND	0.40000	0.60000	ug/L		66.7		40 - 120	
	MSD	2009671-14	ND	0.37000	0.60000	ug/L	7.8	61.7	30	40 - 120	
2,4-Dichlorophenylacetic acid (Surrogate	MS	2009671-14	ND	3.3700	4.0000	ug/L		84.2		40 - 120	
	MSD	2009671-14	ND	3.1400	4.0000	ug/L	7.1	78.5		40 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075334						
Benzene	B075334-BLK1	ND	ug/L	0.50	0.11	
Bromobenzene	B075334-BLK1	ND	ug/L	0.50	0.15	
Bromochloromethane	B075334-BLK1	ND	ug/L	0.50	0.27	
Bromodichloromethane	B075334-BLK1	ND	ug/L	0.50	0.20	
Bromoform	B075334-BLK1	ND	ug/L	0.50	0.46	
Bromomethane	B075334-BLK1	ND	ug/L	0.50	0.20	
n-Butylbenzene	B075334-BLK1	ND	ug/L	0.50	0.15	
sec-Butylbenzene	B075334-BLK1	ND	ug/L	0.50	0.13	
tert-Butylbenzene	B075334-BLK1	ND	ug/L	0.50	0.18	
Carbon tetrachloride	B075334-BLK1	ND	ug/L	0.50	0.17	
Chlorobenzene	B075334-BLK1	ND	ug/L	0.50	0.14	
Chloroethane	B075334-BLK1	ND	ug/L	0.50	0.17	
Chloroform	B075334-BLK1	ND	ug/L	0.50	0.14	
Chloromethane	B075334-BLK1	ND	ug/L	0.50	0.11	
2-Chlorotoluene	B075334-BLK1	ND	ug/L	0.50	0.14	
4-Chlorotoluene	B075334-BLK1	ND	ug/L	0.50	0.093	
Dibromochloromethane	B075334-BLK1	ND	ug/L	0.50	0.22	
1,2-Dibromo-3-chloropropane	B075334-BLK1	ND	ug/L	1.0	0.89	
1,2-Dibromoethane	B075334-BLK1	ND	ug/L	0.50	0.22	
Dibromomethane	B075334-BLK1	ND	ug/L	0.50	0.23	
1,2-Dichlorobenzene	B075334-BLK1	ND	ug/L	0.50	0.21	
1,3-Dichlorobenzene	B075334-BLK1	ND	ug/L	0.50	0.16	
1,4-Dichlorobenzene	B075334-BLK1	ND	ug/L	0.50	0.15	
Dichlorodifluoromethane	B075334-BLK1	ND	ug/L	0.50	0.15	
1,1-Dichloroethane	B075334-BLK1	ND	ug/L	0.50	0.15	
1,2-Dichloroethane	B075334-BLK1	ND	ug/L	0.50	0.17	
1,1-Dichloroethene	B075334-BLK1	ND	ug/L	0.50	0.27	
cis-1,2-Dichloroethene	B075334-BLK1	ND	ug/L	0.50	0.27	
trans-1,2-Dichloroethene	B075334-BLK1	ND	ug/L	0.50	0.17	
1,2-Dichloropropane	B075334-BLK1	ND	ug/L	0.50	0.15	
1,3-Dichloropropane	B075334-BLK1	ND	ug/L	0.50	0.13	
2,2-Dichloropropane	B075334-BLK1	ND	ug/L	0.50	0.18	
1,1-Dichloropropene	B075334-BLK1	ND	ug/L	0.50	0.19	
cis-1,3-Dichloropropene	B075334-BLK1	ND	ug/L	0.50	0.14	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075334						
trans-1,3-Dichloropropene	B075334-BLK1	ND	ug/L	0.50	0.13	
Total 1,3-Dichloropropene	B075334-BLK1	ND	ug/L	0.50	0.27	
Ethylbenzene	B075334-BLK1	ND	ug/L	0.50	0.15	
Hexachlorobutadiene	B075334-BLK1	ND	ug/L	0.50	0.20	
Isopropylbenzene	B075334-BLK1	ND	ug/L	0.50	0.14	
p-Isopropyltoluene	B075334-BLK1	ND	ug/L	0.50	0.14	
Methylene chloride	B075334-BLK1	ND	ug/L	0.50	0.21	
Methyl t-butyl ether	B075334-BLK1	ND	ug/L	0.50	0.14	
Naphthalene	B075334-BLK1	ND	ug/L	0.50	0.16	
n-Propylbenzene	B075334-BLK1	ND	ug/L	0.50	0.12	
Styrene	B075334-BLK1	ND	ug/L	0.50	0.12	
1,1,1,2-Tetrachloroethane	B075334-BLK1	ND	ug/L	0.50	0.21	
1,1,2,2-Tetrachloroethane	B075334-BLK1	ND	ug/L	0.50	0.17	
Tetrachloroethene	B075334-BLK1	ND	ug/L	0.50	0.23	
Toluene	B075334-BLK1	ND	ug/L	0.50	0.17	
1,2,3-Trichlorobenzene	B075334-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trichlorobenzene	B075334-BLK1	ND	ug/L	0.50	0.15	
1,1,1-Trichloroethane	B075334-BLK1	ND	ug/L	0.50	0.21	
1,1,2-Trichloroethane	B075334-BLK1	ND	ug/L	0.50	0.21	
Trichloroethene	B075334-BLK1	ND	ug/L	0.50	0.19	
Trichlorofluoromethane	B075334-BLK1	ND	ug/L	0.50	0.14	
1,2,3-Trichloropropane	B075334-BLK1	ND	ug/L	1.0	0.78	
1,1,2-Trichloro-1,2,2-trifluoroethane	B075334-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trimethylbenzene	B075334-BLK1	ND	ug/L	0.50	0.17	
1,3,5-Trimethylbenzene	B075334-BLK1	ND	ug/L	0.50	0.14	
Vinyl chloride	B075334-BLK1	ND	ug/L	0.50	0.18	
Total Xylenes	B075334-BLK1	ND	ug/L	0.50	0.47	
Total Trihalomethanes	B075334-BLK1	ND	ug/L	2.0	0.97	
t-Amyl Methyl ether	B075334-BLK1	ND	ug/L	0.50	0.19	
t-Butyl alcohol	B075334-BLK1	ND	ug/L	10	9.4	
Diisopropyl ether	B075334-BLK1	ND	ug/L	0.50	0.36	
Ethyl t-butyl ether	B075334-BLK1	ND	ug/L	0.50	0.32	
p- & m-Xylenes	B075334-BLK1	ND	ug/L	0.50	0.34	
o-Xylene	B075334-BLK1	ND	ug/L	0.50	0.13	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075334						
1,2-Dichloroethane-d4 (Surrogate)	B075334-BLK1	100	%	75 - 125 (LCL - UCL)		
Toluene-d8 (Surrogate)	B075334-BLK1	98.9	%	80 - 120 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	B075334-BLK1	102	%	80 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075334										
Benzene	B075334-BS1	LCS	24.780	25.000	ug/L	99.1		70 - 130		
Bromodichloromethane	B075334-BS1	LCS	26.050	25.000	ug/L	104		70 - 130		
Chlorobenzene	B075334-BS1	LCS	24.370	25.000	ug/L	97.5		70 - 130		
Chloroethane	B075334-BS1	LCS	25.240	25.000	ug/L	101		70 - 130		
1,4-Dichlorobenzene	B075334-BS1	LCS	24.830	25.000	ug/L	99.3		70 - 130		
1,1-Dichloroethane	B075334-BS1	LCS	25.980	25.000	ug/L	104		70 - 130		
1,1-Dichloroethene	B075334-BS1	LCS	26.260	25.000	ug/L	105		70 - 130		
Toluene	B075334-BS1	LCS	24.780	25.000	ug/L	99.1		70 - 130		
Trichloroethene	B075334-BS1	LCS	25.370	25.000	ug/L	101		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B075334-BS1	LCS	10.620	10.000	ug/L	106		75 - 125		
Toluene-d8 (Surrogate)	B075334-BS1	LCS	9.9300	10.000	ug/L	99.3		80 - 120		
4-Bromofluorobenzene (Surrogate)	B075334-BS1	LCS	9.9100	10.000	ug/L	99.1		80 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: B075334		Used client sample: N									
Benzene	MS	2010487-07	ND	25.270	25.000	ug/L		101		70 - 130	
	MSD	2010487-07	ND	25.900	25.000	ug/L	2.5	104	20	70 - 130	
Bromodichloromethane	MS	2010487-07	ND	27.510	25.000	ug/L		110		70 - 130	
	MSD	2010487-07	ND	27.900	25.000	ug/L	1.4	112	20	70 - 130	
Chlorobenzene	MS	2010487-07	ND	23.800	25.000	ug/L		95.2		70 - 130	
	MSD	2010487-07	ND	25.180	25.000	ug/L	5.6	101	20	70 - 130	
Chloroethane	MS	2010487-07	ND	25.540	25.000	ug/L		102		70 - 130	
	MSD	2010487-07	ND	26.600	25.000	ug/L	4.1	106	20	70 - 130	
1,4-Dichlorobenzene	MS	2010487-07	ND	24.370	25.000	ug/L		97.5		70 - 130	
	MSD	2010487-07	ND	26.230	25.000	ug/L	7.4	105	20	70 - 130	
1,1-Dichloroethane	MS	2010487-07	ND	26.920	25.000	ug/L		108		70 - 130	
	MSD	2010487-07	ND	27.510	25.000	ug/L	2.2	110	20	70 - 130	
1,1-Dichloroethene	MS	2010487-07	ND	26.310	25.000	ug/L		105		70 - 130	
	MSD	2010487-07	ND	26.770	25.000	ug/L	1.7	107	20	70 - 130	
Toluene	MS	2010487-07	ND	24.380	25.000	ug/L		97.5		70 - 130	
	MSD	2010487-07	ND	25.330	25.000	ug/L	3.8	101	20	70 - 130	
Trichloroethene	MS	2010487-07	ND	24.520	25.000	ug/L		98.1		70 - 130	
	MSD	2010487-07	ND	25.080	25.000	ug/L	2.3	100	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	2010487-07	ND	11.620	10.000	ug/L		116		75 - 125	
	MSD	2010487-07	ND	11.370	10.000	ug/L	2.2	114		75 - 125	
Toluene-d8 (Surrogate)	MS	2010487-07	ND	9.9200	10.000	ug/L		99.2		80 - 120	
	MSD	2010487-07	ND	10.060	10.000	ug/L	1.4	101		80 - 120	
4-Bromofluorobenzene (Surrogate)	MS	2010487-07	ND	10.030	10.000	ug/L		100		80 - 120	
	MSD	2010487-07	ND	10.260	10.000	ug/L	2.3	103		80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B076114						
Acenaphthylene	B076114-BLK1	ND	ug/L	0.10	0.031	
Alachlor	B076114-BLK1	ND	ug/L	0.20	0.090	
Anthracene	B076114-BLK1	ND	ug/L	0.10	0.034	
Atraton	B076114-BLK1	ND	ug/L	0.50	0.057	
Atrazine	B076114-BLK1	ND	ug/L	0.30	0.14	
Benzo[a]anthracene	B076114-BLK1	ND	ug/L	0.20	0.044	
Benzo[b]fluoranthene	B076114-BLK1	ND	ug/L	0.30	0.034	
Benzo[k]fluoranthene	B076114-BLK1	ND	ug/L	0.30	0.072	
Benzo[a]pyrene	B076114-BLK1	ND	ug/L	0.10	0.050	
Benzo[g,h,i]perylene	B076114-BLK1	ND	ug/L	0.30	0.065	
Benzyl butyl phthalate	B076114-BLK1	ND	ug/L	4.0	0.047	
delta-BHC	B076114-BLK1	ND	ug/L	0.20	0.048	
gamma-BHC (Lindane)	B076114-BLK1	ND	ug/L	0.20	0.063	
bis(2-Ethylhexyl)phthalate	B076114-BLK1	ND	ug/L	3.0	0.030	
Bromacil	B076114-BLK1	ND	ug/L	0.50	0.043	
Chrysene	B076114-BLK1	ND	ug/L	0.30	0.060	
Diazinon	B076114-BLK1	ND	ug/L	0.20	0.080	
Dibenzo[a,h]anthracene	B076114-BLK1	ND	ug/L	0.30	0.051	
Di(2-ethylhexyl)adipate	B076114-BLK1	ND	ug/L	1.0	0.025	
Dimethoate	B076114-BLK1	ND	ug/L	2.0	0.050	
Dimethyl phthalate	B076114-BLK1	ND	ug/L	1.0	0.034	
Di-n-butyl phthalate	B076114-BLK1	ND	ug/L	1.0	0.063	
Fluorene	B076114-BLK1	ND	ug/L	0.20	0.029	
Hexachlorobenzene	B076114-BLK1	ND	ug/L	0.20	0.029	
Hexachlorocyclopentadiene	B076114-BLK1	ND	ug/L	1.0	0.12	
Indeno[1,2,3-cd]pyrene	B076114-BLK1	ND	ug/L	0.30	0.032	
Methoxychlor	B076114-BLK1	ND	ug/L	0.30	0.034	
Metolachlor	B076114-BLK1	ND	ug/L	0.50	0.056	
Metribuzin	B076114-BLK1	ND	ug/L	0.50	0.048	
Molinate	B076114-BLK1	ND	ug/L	0.50	0.036	
Phenanthrene	B076114-BLK1	ND	ug/L	0.10	0.020	
Prometon	B076114-BLK1	ND	ug/L	0.50	0.11	
Prometryn	B076114-BLK1	ND	ug/L	0.50	0.045	
Pyrene	B076114-BLK1	ND	ug/L	0.10	0.040	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B076114						
Secbumeton	B076114-BLK1	ND	ug/L	0.50	0.079	
Simazine	B076114-BLK1	ND	ug/L	0.30	0.066	
Terbutryn	B076114-BLK1	ND	ug/L	0.50	0.050	
Thiobencarb	B076114-BLK1	ND	ug/L	0.50	0.044	
Perylene-d12 (Surrogate)	B076114-BLK1	32.0	%	60 - 140 (LCL - UCL)		S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	B076114-BLK1	50.4	%	70 - 130 (LCL - UCL)		S09
Triphenylphosphate (Surrogate)	B076114-BLK1	130	%	70 - 130 (LCL - UCL)		
Pyrene-d10 (Surrogate)	B076114-BLK1	93.4	%	70 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B076114										
Acenaphthylene	B076114-BS1	LCS	0.90000	2.0000	ug/L	45.0		60 - 120		L01
Alachlor	B076114-BS1	LCS	2.3600	2.0000	ug/L	118		60 - 120		
Atrazine	B076114-BS1	LCS	1.3100	2.0000	ug/L	65.5		60 - 120		
Benzo[a]pyrene	B076114-BS1	LCS	1.7000	2.0000	ug/L	85.0		60 - 120		
Chrysene	B076114-BS1	LCS	1.4600	2.0000	ug/L	73.0		60 - 120		
Pyrene	B076114-BS1	LCS	1.9800	2.0000	ug/L	99.0		60 - 120		
Simazine	B076114-BS1	LCS	1.7000	2.0000	ug/L	85.0		60 - 120		
Perylene-d12 (Surrogate)	B076114-BS1	LCS	1.8200	5.0000	ug/L	36.4		60 - 140		S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	B076114-BS1	LCS	2.5000	5.0000	ug/L	50.0		70 - 130		S09
Triphenylphosphate (Surrogate)	B076114-BS1	LCS	6.3500	5.0000	ug/L	127		70 - 130		
Pyrene-d10 (Surrogate)	B076114-BS1	LCS	4.9500	5.0000	ug/L	99.0		70 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B076114		Used client sample: N									
Acenaphthylene	MS	2009671-35	ND	0.87000	2.0000	ug/L		43.5		50 - 120	Q03
	MSD	2009671-35	ND	0.88000	2.0000	ug/L	1.1	44.0	30	50 - 120	Q03
Alachlor	MS	2009671-35	ND	2.6300	2.0000	ug/L		132		50 - 120	Q03
	MSD	2009671-35	ND	2.3000	2.0000	ug/L	13.4	115	30	50 - 120	
Atrazine	MS	2009671-35	ND	1.2800	2.0000	ug/L		64.0		50 - 120	
	MSD	2009671-35	ND	1.1500	2.0000	ug/L	10.7	57.5	30	50 - 120	
Benzo[a]pyrene	MS	2009671-35	ND	1.5600	2.0000	ug/L		78.0		50 - 120	
	MSD	2009671-35	ND	1.5500	2.0000	ug/L	0.6	77.5	30	50 - 120	
Chrysene	MS	2009671-35	ND	1.5200	2.0000	ug/L		76.0		50 - 120	
	MSD	2009671-35	ND	1.9200	2.0000	ug/L	23.3	96.0	30	50 - 120	
Pyrene	MS	2009671-35	ND	1.9700	2.0000	ug/L		98.5		50 - 120	
	MSD	2009671-35	ND	1.9100	2.0000	ug/L	3.1	95.5	30	50 - 120	
Simazine	MS	2009671-35	ND	1.7500	2.0000	ug/L		87.5		50 - 120	
	MSD	2009671-35	ND	1.5700	2.0000	ug/L	10.8	78.5	30	50 - 120	
Perylene-d12 (Surrogate)	MS	2009671-35	ND	1.5900	5.0000	ug/L		31.8		60 - 140	S09
	MSD	2009671-35	ND	1.6300	5.0000	ug/L	2.5	32.6		60 - 140	S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	MS	2009671-35	ND	2.5100	5.0000	ug/L		50.2		70 - 130	S09
	MSD	2009671-35	ND	2.4500	5.0000	ug/L	2.4	49.0		70 - 130	S09
Triphenylphosphate (Surrogate)	MS	2009671-35	ND	6.6600	5.0000	ug/L		133		70 - 130	S09
	MSD	2009671-35	ND	4.9300	5.0000	ug/L	29.9	98.6		70 - 130	
Pyrene-d10 (Surrogate)	MS	2009671-35	ND	4.9400	5.0000	ug/L		98.8		70 - 130	
	MSD	2009671-35	ND	4.9200	5.0000	ug/L	0.4	98.4		70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075919						
Oil and Grease	B075919-BLK1	ND	mg/L	5.0	0.66	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Laboratory Control Sample

								Control Limits		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab Quals
Oil and Grease	QC Batch ID: B075919									
	B075919-BS1	LCS	40.900	40.300	mg/L	101		78 - 114		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075919		Used client sample: N									
Oil and Grease	DUP	2009671-08	ND	ND		mg/L			18		
	MS	2009671-08	ND	41.600	40.300	mg/L		103		78 - 114	
	MSD	2009671-08	ND	41.700	40.300	mg/L	0.2	103	18	78 - 114	

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B^D0141						
Total Nitrogen	B^D0141-BLK1	ND	mg/L	0.30	0.10	
QC Batch ID: B075339						
Non-Volatile Organic Carbon	B075339-BLK1	ND	mg/L	1.0	0.30	
QC Batch ID: B075354						
Chloride	B075354-BLK1	ND	mg/L	0.50	0.13	
Nitrate as N	B075354-BLK1	ND	mg/L	0.10	0.024	
Sulfate	B075354-BLK1	ND	mg/L	1.0	0.14	
QC Batch ID: B075436						
Total Suspended Solids (Glass Fiber)	B075436-BLK1	ND	mg/L	0.50	0.50	
QC Batch ID: B075548						
MBAS	B075548-BLK1	ND	mg/L	0.10	0.025	
QC Batch ID: B075605						
Nitrite as N	B075605-BLK1	ND	ug/L	50	10	
QC Batch ID: B075627						
Total Dissolved Solids @ 180 C	B075627-BLK1	ND	mg/L	6.7	3.3	
QC Batch ID: B076461						
Total Kjeldahl Nitrogen	B076461-BLK1	ND	mg/L	0.20	0.067	
QC Batch ID: B076462						
Total Phosphorus	B076462-BLK1	ND	mg/L	0.050	0.017	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075339										
Non-Volatile Organic Carbon	B075339-BS1	LCS	5.2450	5.0000	mg/L	105		85 - 115		
QC Batch ID: B075354										
Chloride	B075354-BS1	LCS	51.313	50.000	mg/L	103		90 - 110		
Nitrate as N	B075354-BS1	LCS	5.0580	5.0000	mg/L	101		90 - 110		
Sulfate	B075354-BS1	LCS	102.79	100.00	mg/L	103		90 - 110		
QC Batch ID: B075548										
MBAS	B075548-BS1	LCS	0.19370	0.20000	mg/L	96.8		85 - 115		
QC Batch ID: B075605										
Nitrite as N	B075605-BS1	LCS	514.82	500.00	ug/L	103		90 - 110		
QC Batch ID: B075627										
Total Dissolved Solids @ 180 C	B075627-BS1	LCS	620.00	586.00	mg/L	106		90 - 110		
QC Batch ID: B076461										
Total Kjeldahl Nitrogen	B076461-BS1	LCS	2.1415	2.0000	mg/L	107		90 - 110		
QC Batch ID: B076462										
Total Phosphorus	B076462-BS1	LCS	0.99110	1.0000	mg/L	99.1		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075339		Used client sample: N									
Non-Volatile Organic Carbon	DUP	2010713-01	0.36900	0.33900		mg/L	8.5		10		J
	MS	2010713-01	0.36900	5.4693	5.0251	mg/L		101		80 - 120	
	MSD	2010713-01	0.36900	5.4121	5.0251	mg/L	1.1	100	10	80 - 120	
QC Batch ID: B075354		Used client sample: Y - Description: UP, 04/10/2020 14:30									
Chloride	DUP	2010716-01	50.448	50.258		mg/L	0.4		10		
	MS	2010716-01	50.448	103.42	50.505	mg/L		105		80 - 120	
	MSD	2010716-01	50.448	103.58	50.505	mg/L	0.1	105	10	80 - 120	
Nitrate as N	DUP	2010716-01	0.24700	0.22600		mg/L	8.9		10		
	MS	2010716-01	0.24700	5.2343	5.0505	mg/L		98.7		80 - 120	
	MSD	2010716-01	0.24700	5.2545	5.0505	mg/L	0.4	99.1	10	80 - 120	
Sulfate	DUP	2010716-01	46.946	46.718		mg/L	0.5		10		
	MS	2010716-01	46.946	155.51	101.01	mg/L		107		80 - 120	
	MSD	2010716-01	46.946	155.57	101.01	mg/L	0.0	108	10	80 - 120	
QC Batch ID: B075436		Used client sample: Y - Description: MID, 04/10/2020 13:30									
Total Suspended Solids (Glass Fiber)	DUP	2010716-02	2400.0	2404.5		mg/L	0.2		10		
QC Batch ID: B075548		Used client sample: N									
MBAS	DUP	2010742-01	ND	ND		mg/L			20		
	MS	2010742-01	ND	0.40480	0.40000	mg/L		101		80 - 120	
	MSD	2010742-01	ND	0.39320	0.40000	mg/L	2.9	98.3	20	80 - 120	
QC Batch ID: B075605		Used client sample: Y - Description: UP, 04/10/2020 14:30									
Nitrite as N	DUP	2010716-01	ND	ND		ug/L			10		
	MS	2010716-01	ND	530.00	526.32	ug/L		101		90 - 110	
	MSD	2010716-01	ND	545.11	526.32	ug/L	2.8	104	10	90 - 110	
QC Batch ID: B075627		Used client sample: N									
Total Dissolved Solids @ 180 C	DUP	2011006-01	15500	15400		mg/L	0.6		10		
QC Batch ID: B076461		Used client sample: N									
Total Kjeldahl Nitrogen	DUP	2010701-10	0.27170	0.22290		mg/L	19.7		20		
	MS	2010701-10	0.27170	2.2322	2.0000	mg/L		98.0		90 - 110	
	MSD	2010701-10	0.27170	2.1980	2.0000	mg/L	1.5	96.3	20	90 - 110	
QC Batch ID: B076462		Used client sample: N									
Total Phosphorus	DUP	2010701-10	0.18190	0.19700		mg/L	8.0		20		
	MS	2010701-10	0.18190	1.2260	1.0000	mg/L		104		80 - 120	
	MSD	2010701-10	0.18190	1.1927	1.0000	mg/L	2.8	101	20	80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075327						
Total Recoverable Iron	B075327-BLK1	ND	ug/L	50	30	
Total Recoverable Manganese	B075327-BLK1	ND	ug/L	10	4.0	
QC Batch ID: B075555						
Total Recoverable Antimony	B075555-BLK1	ND	ug/L	2.0	0.11	
Total Recoverable Arsenic	B075555-BLK1	ND	ug/L	2.0	0.70	
Total Recoverable Barium	B075555-BLK1	0.21500	ug/L	1.0	0.21	J
Total Recoverable Beryllium	B075555-BLK1	ND	ug/L	1.0	0.14	
Total Recoverable Cadmium	B075555-BLK1	ND	ug/L	1.0	0.11	
Total Recoverable Chromium	B075555-BLK1	ND	ug/L	3.0	0.50	
Total Recoverable Cobalt	B075555-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Copper	B075555-BLK1	0.39200	ug/L	2.0	0.22	J
Total Recoverable Lead	B075555-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Molybdenum	B075555-BLK1	ND	ug/L	1.0	0.11	
Total Recoverable Nickel	B075555-BLK1	0.44800	ug/L	2.0	0.19	J
Total Recoverable Selenium	B075555-BLK1	ND	ug/L	2.0	0.19	
Total Recoverable Thallium	B075555-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Vanadium	B075555-BLK1	ND	ug/L	3.0	0.78	
Total Recoverable Zinc	B075555-BLK1	2.5360	ug/L	10	1.7	J
QC Batch ID: B075618						
Total Recoverable Mercury	B075618-BLK1	ND	ug/L	0.20	0.022	
QC Batch ID: B075654						
Total Recoverable Silver	B075654-BLK1	ND	ug/L	1.0	0.10	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075327										
Total Recoverable Iron	B075327-BS1	LCS	1023.2	1000.0	ug/L	102		85 - 115		
Total Recoverable Manganese	B075327-BS1	LCS	499.89	500.00	ug/L	100		85 - 115		
QC Batch ID: B075555										
Total Recoverable Antimony	B075555-BS1	LCS	42.616	40.000	ug/L	107		85 - 115		
Total Recoverable Arsenic	B075555-BS1	LCS	104.20	100.00	ug/L	104		85 - 115		
Total Recoverable Barium	B075555-BS1	LCS	42.860	40.000	ug/L	107		85 - 115		
Total Recoverable Beryllium	B075555-BS1	LCS	45.562	40.000	ug/L	114		85 - 115		
Total Recoverable Cadmium	B075555-BS1	LCS	43.246	40.000	ug/L	108		85 - 115		
Total Recoverable Chromium	B075555-BS1	LCS	42.294	40.000	ug/L	106		85 - 115		
Total Recoverable Cobalt	B075555-BS1	LCS	43.402	40.000	ug/L	109		85 - 115		
Total Recoverable Copper	B075555-BS1	LCS	107.07	100.00	ug/L	107		85 - 115		
Total Recoverable Lead	B075555-BS1	LCS	111.05	100.00	ug/L	111		85 - 115		
Total Recoverable Molybdenum	B075555-BS1	LCS	39.085	40.000	ug/L	97.7		85 - 115		
Total Recoverable Nickel	B075555-BS1	LCS	111.41	100.00	ug/L	111		85 - 115		
Total Recoverable Selenium	B075555-BS1	LCS	105.00	100.00	ug/L	105		85 - 115		
Total Recoverable Thallium	B075555-BS1	LCS	43.127	40.000	ug/L	108		85 - 115		
Total Recoverable Vanadium	B075555-BS1	LCS	40.412	40.000	ug/L	101		85 - 115		
Total Recoverable Zinc	B075555-BS1	LCS	109.71	100.00	ug/L	110		85 - 115		
QC Batch ID: B075618										
Total Recoverable Mercury	B075618-BS1	LCS	0.96000	1.0000	ug/L	96.0		85 - 115		
QC Batch ID: B075654										
Total Recoverable Silver	B075654-BS1	LCS	39.553	40.000	ug/L	98.9		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab
Quals											
QC Batch ID: B075327		Used client sample: N									
Total Recoverable Iron	DUP	2010690-01	98.938	117.09		ug/L	16.8		20		
	MS	2010690-01	98.938	1235.6	1000.0	ug/L		114		75 - 125	
	MSD	2010690-01	98.938	1214.5	1000.0	ug/L	1.7	112	20	75 - 125	
Total Recoverable Manganese	DUP	2010690-01	4.4064	4.7616		ug/L	7.7		20		J
	MS	2010690-01	4.4064	532.46	500.00	ug/L		106		75 - 125	
	MSD	2010690-01	4.4064	517.87	500.00	ug/L	2.8	103	20	75 - 125	
QC Batch ID: B075555		Used client sample: N									
Total Recoverable Antimony	DUP	2010710-02	1.1120	1.0640		ug/L	4.4		20		J
	MS	2010710-02	1.1120	43.877	40.000	ug/L		107		70 - 130	
	MSD	2010710-02	1.1120	44.252	40.000	ug/L	0.9	108	20	70 - 130	
Total Recoverable Arsenic	DUP	2010710-02	ND	ND		ug/L			20		
	MS	2010710-02	ND	104.61	100.00	ug/L		105		70 - 130	
	MSD	2010710-02	ND	106.23	100.00	ug/L	1.5	106	20	70 - 130	
Total Recoverable Barium	DUP	2010710-02	6.6900	6.5450		ug/L	2.2		20		
	MS	2010710-02	6.6900	50.030	40.000	ug/L		108		70 - 130	
	MSD	2010710-02	6.6900	50.649	40.000	ug/L	1.2	110	20	70 - 130	
Total Recoverable Beryllium	DUP	2010710-02	ND	ND		ug/L			20		
	MS	2010710-02	ND	44.532	40.000	ug/L		111		70 - 130	
	MSD	2010710-02	ND	44.902	40.000	ug/L	0.8	112	20	70 - 130	
Total Recoverable Cadmium	DUP	2010710-02	ND	ND		ug/L			20		
	MS	2010710-02	ND	42.584	40.000	ug/L		106		70 - 130	
	MSD	2010710-02	ND	42.915	40.000	ug/L	0.8	107	20	70 - 130	
Total Recoverable Chromium	DUP	2010710-02	2.4390	2.3050		ug/L	5.6		20		J
	MS	2010710-02	2.4390	44.396	40.000	ug/L		105		70 - 130	
	MSD	2010710-02	2.4390	44.524	40.000	ug/L	0.3	105	20	70 - 130	
Total Recoverable Cobalt	DUP	2010710-02	0.14700	0.14700		ug/L	0		20		J
	MS	2010710-02	0.14700	42.808	40.000	ug/L		107		70 - 130	
	MSD	2010710-02	0.14700	42.969	40.000	ug/L	0.4	107	20	70 - 130	
Total Recoverable Copper	DUP	2010710-02	4.0050	3.6880		ug/L	8.2		20		
	MS	2010710-02	4.0050	112.20	100.00	ug/L		108		70 - 130	
	MSD	2010710-02	4.0050	115.20	100.00	ug/L	2.6	111	20	70 - 130	
Total Recoverable Lead	DUP	2010710-02	0.61100	0.54400		ug/L	11.6		20		J
	MS	2010710-02	0.61100	110.48	100.00	ug/L		110		70 - 130	
	MSD	2010710-02	0.61100	111.81	100.00	ug/L	1.2	111	20	70 - 130	
Total Recoverable Molybdenum	DUP	2010710-02	0.23900	0.21700		ug/L	9.6		20		J
	MS	2010710-02	0.23900	41.003	40.000	ug/L		102		70 - 130	
	MSD	2010710-02	0.23900	40.606	40.000	ug/L	1.0	101	20	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: B075555		Used client sample: N									
Total Recoverable Nickel	DUP	2010710-02	2.6650	2.5580		ug/L	4.1		20		
	MS	2010710-02	2.6650	111.88	100.00	ug/L		109		70 - 130	
	MSD	2010710-02	2.6650	111.68	100.00	ug/L	0.2	109	20	70 - 130	
Total Recoverable Selenium	DUP	2010710-02	ND	ND		ug/L			20		
	MS	2010710-02	ND	103.91	100.00	ug/L		104		70 - 130	
	MSD	2010710-02	ND	104.97	100.00	ug/L	1.0	105	20	70 - 130	
Total Recoverable Thallium	DUP	2010710-02	ND	ND		ug/L			20		
	MS	2010710-02	ND	43.735	40.000	ug/L		109		70 - 130	
	MSD	2010710-02	ND	43.711	40.000	ug/L	0.1	109	20	70 - 130	
Total Recoverable Vanadium	DUP	2010710-02	ND	ND		ug/L			20		
	MS	2010710-02	ND	42.586	40.000	ug/L		106		70 - 130	
	MSD	2010710-02	ND	42.333	40.000	ug/L	0.6	106	20	70 - 130	
Total Recoverable Zinc	DUP	2010710-02	42.077	39.087		ug/L	7.4		20		
	MS	2010710-02	42.077	145.82	100.00	ug/L		104		70 - 130	
	MSD	2010710-02	42.077	150.76	100.00	ug/L	3.3	109	20	70 - 130	
QC Batch ID: B075618		Used client sample: N									
Total Recoverable Mercury	DUP	2010742-01	ND	ND		ug/L			20		
	MS	2010742-01	ND	0.94500	1.0000	ug/L		94.5		70 - 130	
	MSD	2010742-01	ND	0.97500	1.0000	ug/L	3.1	97.5	20	70 - 130	
QC Batch ID: B075654		Used client sample: N									
Total Recoverable Silver	DUP	2010966-01	ND	ND		ug/L			20		
	MS	2010966-01	ND	40.688	40.000	ug/L		102		70 - 130	
	MSD	2010966-01	ND	40.768	40.000	ug/L	0.2	102	20	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 04/30/2020 14:58
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A07	Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
A20	Surrogate is low due to matrix interference. Interference verified through second extraction/analysis.
A26	Sample received past holding time.
L01	The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
Q03	Matrix spike recovery(s) was(were) not within the control limits.
S05	The sample holding time was exceeded.
S09	The surrogate recovery for this compound was not within the control limits.
V11	The Continuing Calibration Verification (CCV) recovery was not within established control limits.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 05/01/2020

Sarah Battelle

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Client Project: S020.1016
BCL Project: Cottonwood Sand Mine Project
BCL Work Order: 2011102
Invoice ID: B378973

Enclosed are the results of analyses for samples received by the laboratory on 4/15/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	3
Laboratory / Client Sample Cross Reference.....	5

Sample Results

2011102-01 - Down

Organochlorine Pesticides and PCB's (EPA Method 508).....	6
Organic Analysis (EPA Method 515.1).....	7
Volatile Organic Analysis (EPA Method 524.2).....	8
Organic Analysis by Liquid Solids Extraction (EPA Method 525.2).....	11
EPA Method 1664.....	13
Water Analysis (General Chemistry).....	14
Metals Analysis.....	15

2011102-02 - Trip Blanks

Volatile Organic Analysis (EPA Method 524.2).....	16
---	----

Quality Control Reports

Organochlorine Pesticides and PCB's (EPA Method 508)

Method Blank Analysis.....	19
Laboratory Control Sample.....	20
Precision and Accuracy.....	21

Organic Analysis (EPA Method 515.1)

Method Blank Analysis.....	22
Laboratory Control Sample.....	23
Precision and Accuracy.....	24

Volatile Organic Analysis (EPA Method 524.2)

Method Blank Analysis.....	25
Laboratory Control Sample.....	28
Precision and Accuracy.....	29

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Method Blank Analysis.....	30
Laboratory Control Sample.....	32
Precision and Accuracy.....	33

EPA Method 1664

Method Blank Analysis.....	34
Laboratory Control Sample.....	35
Precision and Accuracy.....	36

Water Analysis (General Chemistry)

Method Blank Analysis.....	37
Laboratory Control Sample.....	38
Precision and Accuracy.....	39

Metals Analysis

Method Blank Analysis.....	40
Laboratory Control Sample.....	41
Precision and Accuracy.....	42

Notes

Notes and Definitions.....	44
----------------------------	----

Page 3 of 44



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2011102 Page 2 of 2

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 Of 1							
Submission #: <u>26-1102</u>											
SHIPPING INFORMATION			SHIPPING CONTAINER		FREE LIQUID						
Fed Ex ☐	UPS ☐	Ontrac ☐ Hand Delivery ☐	Ice Chest ☒	None ☐ Box ☐	YES ☐ NO ☐						
BC Lab Field Service ☐ Other ☒ (Specify) <u>CSO</u>			Other ☐ (Specify) _____		W / S _____						
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: _____											
Custody Seals Ice Chest ☐ Containers ☐ None ☒ Comments: _____											
Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐											
All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☐ No ☐ Description(s) match COC? Yes ☒ No ☐											
COC Received ☒ YES ☐ NO		Emissivity: <u>9-1</u>	Container: <u>PE</u>	Thermometer ID: <u>274</u>	Date/Time: <u>4/5/20 845</u>						
		Temperature: (A) <u>0.9</u> °C / (C) <u>0.6</u> °C	Analyst Init: <u>TKJ</u>								
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES		<u>216</u>									
4oz / 8oz / 16oz PE UNPRES											
2oz Cr ⁶											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz		<u>L</u>									
PT CYANIDE											
PT NITROGEN FORMS		<u>M</u>									
PT TOTAL SULFIDE											
3oz. NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON		<u>N</u>									
PT CHEMICAL OXYGEN DEMAND											
PIA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK		<u>104</u>	<u>804</u>								
40ml VOA VIAL		<u>044</u>	<u>A-3</u>								
QT EPA 1664		<u>0</u>									
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40 ml VOA VIAL- 504											
QT EPA 5040/5050		<u>804</u>	<u>044</u>	<u>P</u>							
QT EPA 515.1/515		<u>044</u>	<u>044</u>	<u>044</u>							
QT EPA 525				<u>T</u>							
QT EPA 525 TRAVEL BLANK											
40ml EPA 547											
40ml EPA 531.1											
8oz EPA 548											
QT EPA 549											
QT EPA 8015M											
QT EPA 8270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOIL SLEEVE											
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											
Comments: _____											
Sample Numbering Completed By: <u>JK</u> Date/Time: <u>4/5/20</u> <u>1211</u> Rev 21 05/23/2016											
= Actual / C = Corrected											

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2011102-01	COC Number:	---	Receive Date:	04/15/2020 08:45
	Project Number:	---	Sampling Date:	04/14/2020 10:45
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Down	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
2011102-02	COC Number:	---	Receive Date:	04/15/2020 08:45
	Project Number:	---	Sampling Date:	04/14/2020 00:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Trip Blanks	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Trip Blank

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM							
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #	
Aldrin	ND	ug/L	0.0050	0.00095	EPA-508	ND		1	
alpha-BHC	ND	ug/L	0.0050	0.00050	EPA-508	ND		1	
beta-BHC	ND	ug/L	0.0050	0.00064	EPA-508	ND		1	
delta-BHC	ND	ug/L	0.0050	0.0015	EPA-508	ND		1	
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.00067	EPA-508	ND		1	
Chlordane (Technical)	ND	ug/L	0.10	0.045	EPA-508	ND		1	
4,4'-DDD	ND	ug/L	0.0050	0.00086	EPA-508	ND		1	
4,4'-DDE	ND	ug/L	0.0050	0.0013	EPA-508	ND		1	
4,4'-DDT	ND	ug/L	0.0050	0.00096	EPA-508	ND		1	
Dieldrin	ND	ug/L	0.0050	0.0011	EPA-508	ND		1	
Endosulfan I	ND	ug/L	0.0050	0.00068	EPA-508	ND		1	
Endosulfan II	ND	ug/L	0.0050	0.00098	EPA-508	ND		1	
Endosulfan sulfate	ND	ug/L	0.0050	0.00055	EPA-508	ND		1	
Endrin	ND	ug/L	0.0050	0.00069	EPA-508	ND		1	
Endrin aldehyde	ND	ug/L	0.010	0.00054	EPA-508	ND		1	
Heptachlor	ND	ug/L	0.0050	0.00094	EPA-508	ND		1	
Heptachlor epoxide	ND	ug/L	0.0050	0.00064	EPA-508	ND		1	
Methoxychlor	ND	ug/L	0.0050	0.0037	EPA-508	ND		1	
Toxaphene	ND	ug/L	1.0	0.20	EPA-508	ND		1	
PCB-1016	ND	ug/L	0.20	0.066	EPA-508	ND		1	
PCB-1221	ND	ug/L	0.20	0.063	EPA-508	ND		1	
PCB-1232	ND	ug/L	0.20	0.059	EPA-508	ND		1	
PCB-1242	ND	ug/L	0.20	0.037	EPA-508	ND		1	
PCB-1248	ND	ug/L	0.20	0.044	EPA-508	ND		1	
PCB-1254	ND	ug/L	0.20	0.037	EPA-508	ND		1	
PCB-1260	ND	ug/L	0.20	0.089	EPA-508	ND		1	
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-508	ND		1	
TCMX (Surrogate)	74.6	%	60 - 130 (LCL - UCL)		EPA-508			1	
Decachlorobiphenyl (Surrogate)	63.1	%	60 - 130 (LCL - UCL)		EPA-508			1	

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-508	04/20/20 21:00	04/24/20 04:22		HKS	GC-17	1	B076081	EPA 508

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bentazon	ND	ug/L	0.80	0.22	EPA-515.1	ND		1
2,4-D	ND	ug/L	0.40	0.18	EPA-515.1	ND		1
2,4-DB	ND	ug/L	3.0	0.37	EPA-515.1	ND		1
Dalapon	ND	ug/L	5.0	0.31	EPA-515.1	ND		1
Dicamba	ND	ug/L	0.080	0.040	EPA-515.1	ND		1
Dichloroprop	ND	ug/L	0.50	0.11	EPA-515.1	ND		1
Dinoseb	ND	ug/L	0.20	0.057	EPA-515.1	ND		1
MCPA	ND	ug/L	10	6.0	EPA-515.1	ND		1
MCPP	ND	ug/L	10	6.0	EPA-515.1	ND		1
2,4,5-T	ND	ug/L	0.090	0.012	EPA-515.1	ND		1
2,4,5-TP (Silvex)	ND	ug/L	0.070	0.032	EPA-515.1	ND		1
2,4-Dichlorophenylacetic acid (Surrogate)	79.8	%	40 - 120 (LCL - UCL)		EPA-515.1			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-515.1	04/17/20 21:00	04/21/20 18:52	OLH	GC-8	1	B076077	EPA 515.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND	V11	1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND	V11	1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND	V11	1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2011102-01	Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	116	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	98.6	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	98.6	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	04/16/20 06:00	04/17/20 12:57	ZZZ	MS-V15	1	B075616	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthylene	ND	ug/L	0.10	0.031	EPA-525.2	ND		1
Alachlor	ND	ug/L	0.20	0.090	EPA-525.2	ND		1
Anthracene	ND	ug/L	0.10	0.034	EPA-525.2	ND		1
Atraton	ND	ug/L	0.50	0.057	EPA-525.2	ND		1
Atrazine	ND	ug/L	0.30	0.14	EPA-525.2	ND		1
Benzo[a]anthracene	ND	ug/L	0.20	0.044	EPA-525.2	ND		1
Benzo[b]fluoranthene	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Benzo[k]fluoranthene	ND	ug/L	0.30	0.072	EPA-525.2	ND		1
Benzo[a]pyrene	ND	ug/L	0.10	0.050	EPA-525.2	ND		1
Benzo[g,h,i]perylene	ND	ug/L	0.30	0.065	EPA-525.2	ND		1
Benzyl butyl phthalate	ND	ug/L	4.0	0.047	EPA-525.2	ND		1
delta-BHC	ND	ug/L	0.20	0.048	EPA-525.2	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.20	0.063	EPA-525.2	ND		1
bis(2-Ethylhexyl)phthalate	ND	ug/L	3.0	0.030	EPA-525.2	ND		1
Bromacil	ND	ug/L	0.50	0.043	EPA-525.2	ND		1
Chrysene	ND	ug/L	0.30	0.060	EPA-525.2	ND		1
Diazinon	ND	ug/L	0.20	0.080	EPA-525.2	ND		1
Dibenzo[a,h]anthracene	ND	ug/L	0.30	0.051	EPA-525.2	ND		1
Di(2-ethylhexyl)adipate	ND	ug/L	1.0	0.025	EPA-525.2	ND		1
Dimethoate	ND	ug/L	2.0	0.050	EPA-525.2	ND		1
Dimethyl phthalate	ND	ug/L	1.0	0.034	EPA-525.2	ND		1
Di-n-butyl phthalate	ND	ug/L	1.0	0.063	EPA-525.2	ND		1
Fluorene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorobenzene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorocyclopentadiene	ND	ug/L	1.0	0.12	EPA-525.2	ND		1
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.30	0.032	EPA-525.2	ND		1
Methoxychlor	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Metolachlor	ND	ug/L	0.50	0.056	EPA-525.2	ND		1
Metribuzin	ND	ug/L	0.50	0.048	EPA-525.2	ND		1
Molinate	ND	ug/L	0.50	0.036	EPA-525.2	ND		1
Phenanthrene	ND	ug/L	0.10	0.020	EPA-525.2	ND		1
Prometon	ND	ug/L	0.50	0.11	EPA-525.2	ND		1
Prometryn	ND	ug/L	0.50	0.045	EPA-525.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Pyrene	ND	ug/L	0.10	0.040	EPA-525.2	ND		1
Secbumeton	ND	ug/L	0.50	0.079	EPA-525.2	ND		1
Simazine	ND	ug/L	0.30	0.066	EPA-525.2	ND		1
Terbutryn	ND	ug/L	0.50	0.050	EPA-525.2	ND		1
Thiobencarb	ND	ug/L	0.50	0.044	EPA-525.2	ND		1
Perylene-d12 (Surrogate)	60.0	%	60 - 140 (LCL - UCL)		EPA-525.2			1
1,3-Dimethyl-2-nitrobenzene (Surrogate)	50.6	%	70 - 130 (LCL - UCL)		EPA-525.2		S09	1
Triphenylphosphate (Surrogate)	130	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Pyrene-d10 (Surrogate)	100	%	70 - 130 (LCL - UCL)		EPA-525.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-525.2	04/20/20 07:30	04/23/20 15:23	MK	MS-B6	1	B076114	EPA 525.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

BCL Sample ID:	2011102-01	Client Sample Name:	Down, 4/14/2020 10:45:00AM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/L	5.0	0.66	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-1664A HEM	04/17/20 12:00	04/20/20 15:16	MAM	MAN-SV	1	B075919	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

BCL Sample ID:	2011102-01	Client Sample Name:	Down, 4/14/2020 10:45:00AM					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Chloride	150	mg/L	0.50	0.13	EPA-300.0	ND		1
Nitrate as N	0.42	mg/L	0.10	0.024	EPA-300.0	ND		1
Sulfate	58	mg/L	1.0	0.14	EPA-300.0	ND		1
Total Dissolved Solids @ 180 C	570	mg/L	33	17	EPA-160.1	ND	A07	2
Total Suspended Solids (Glass Fiber)	8.2	mg/L	0.62	0.62	EPA-160.2	ND	A07	3
MBAS	0.050	mg/L	0.10	0.025	EPA-425.1	ND	J	4
Total Nitrogen	1.0	mg/L	0.30	0.10	Calc	ND		5
Total Kjeldahl Nitrogen	0.60	mg/L	0.20	0.067	EPA-351.2	ND		6
Total Phosphorus	0.069	mg/L	0.050	0.017	EPA-365.4	ND		7

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-300.0	04/15/20 17:00	04/15/20 22:26	CMM	IC7	1	B075611	No Prep
2	EPA-160.1	04/20/20 14:00	04/20/20 14:00	CAD	MANUAL	3.333	B075881	No Prep
3	EPA-160.2	04/17/20 08:47	04/17/20 08:47	OJP	MANUAL	1.250	B075800	No Prep
4	EPA-425.1	04/15/20 10:15	04/15/20 10:15	JMN	SPEC06	1	B075549	No Prep
5	Calc	04/17/20 10:01	04/30/20 15:01	AMM	Calc	1	B^D0186	Calc
6	EPA-351.2	04/28/20 17:00	04/29/20 13:13	JMH2	SC-2	1	B076644	EPA 351.2
7	EPA-365.4	04/28/20 17:00	05/01/20 11:28	JMH2	SC-1	1	B076645	EPA 365.4

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

BCL Sample ID: 2011102-01		Client Sample Name: Down, 4/14/2020 10:45:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Antimony	0.16	ug/L	2.0	0.11	EPA-200.8	ND	J	1
Total Recoverable Arsenic	1.5	ug/L	2.0	0.70	EPA-200.8	ND	J	1
Total Recoverable Barium	62	ug/L	1.0	0.21	EPA-200.8	ND		1
Total Recoverable Beryllium	ND	ug/L	1.0	0.14	EPA-200.8	ND		1
Total Recoverable Cadmium	ND	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Chromium	ND	ug/L	3.0	0.50	EPA-200.8	ND		1
Total Recoverable Cobalt	0.49	ug/L	1.0	0.10	EPA-200.8	ND	J	1
Total Recoverable Copper	2.5	ug/L	2.0	0.22	EPA-200.8	0.35		1
Total Recoverable Iron	240	ug/L	50	30	EPA-200.7	ND		2
Total Recoverable Lead	0.28	ug/L	1.0	0.10	EPA-200.8	ND	J	1
Total Recoverable Manganese	49	ug/L	10	4.0	EPA-200.7	ND		2
Total Recoverable Mercury	ND	ug/L	0.20	0.022	EPA-245.1	ND		3
Total Recoverable Molybdenum	3.3	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Nickel	2.1	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Selenium	1.9	ug/L	2.0	0.19	EPA-200.8	ND	J	1
Total Recoverable Silver	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Thallium	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Vanadium	6.3	ug/L	3.0	0.78	EPA-200.8	ND		1
Total Recoverable Zinc	3.0	ug/L	10	1.7	EPA-200.8	ND	J	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-200.8	04/20/20 09:30	04/20/20 18:59	AS1	PE-EL4	1	B075898	EPA 200.2
2	EPA-200.7	04/17/20 20:00	04/20/20 14:47	JRG	PE-OP4	1	B075819	EPA 200.2
3	EPA-245.1	04/20/20 10:00	04/21/20 09:18	TMT	CETAC3	1	B075879	EPA 245.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2011102-02		Client Sample Name: Trip Blanks, 4/14/2020 12:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND	V11	1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND	V11	1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2011102-02		Client Sample Name: Trip Blanks, 4/14/2020 12:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND	V11	1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2011102-02	Client Sample Name: Trip Blanks, 4/14/2020 12:00:00AM						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	120	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	98.4	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	101	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	04/16/20 06:00	04/17/20 12:13	ZZZ	MS-V15	1	B075616	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B076081						
Aldrin	B076081-BLK1	ND	ug/L	0.0050	0.00095	
alpha-BHC	B076081-BLK1	ND	ug/L	0.0050	0.00050	
beta-BHC	B076081-BLK1	ND	ug/L	0.0050	0.00064	
delta-BHC	B076081-BLK1	ND	ug/L	0.0050	0.0015	
gamma-BHC (Lindane)	B076081-BLK1	ND	ug/L	0.0050	0.00067	
Chlordane (Technical)	B076081-BLK1	ND	ug/L	0.10	0.045	
4,4'-DDD	B076081-BLK1	ND	ug/L	0.0050	0.00086	
4,4'-DDE	B076081-BLK1	ND	ug/L	0.0050	0.0013	
4,4'-DDT	B076081-BLK1	ND	ug/L	0.0050	0.00096	
Dieldrin	B076081-BLK1	ND	ug/L	0.0050	0.0011	
Endosulfan I	B076081-BLK1	ND	ug/L	0.0050	0.00068	
Endosulfan II	B076081-BLK1	ND	ug/L	0.0050	0.00098	
Endosulfan sulfate	B076081-BLK1	ND	ug/L	0.0050	0.00055	
Endrin	B076081-BLK1	ND	ug/L	0.0050	0.00069	
Endrin aldehyde	B076081-BLK1	ND	ug/L	0.010	0.00054	
Heptachlor	B076081-BLK1	ND	ug/L	0.0050	0.00094	
Heptachlor epoxide	B076081-BLK1	ND	ug/L	0.0050	0.00064	
Methoxychlor	B076081-BLK1	ND	ug/L	0.0050	0.0037	
Toxaphene	B076081-BLK1	ND	ug/L	1.0	0.20	
PCB-1016	B076081-BLK1	ND	ug/L	0.20	0.066	
PCB-1221	B076081-BLK1	ND	ug/L	0.20	0.063	
PCB-1232	B076081-BLK1	ND	ug/L	0.20	0.059	
PCB-1242	B076081-BLK1	ND	ug/L	0.20	0.037	
PCB-1248	B076081-BLK1	ND	ug/L	0.20	0.044	
PCB-1254	B076081-BLK1	ND	ug/L	0.20	0.037	
PCB-1260	B076081-BLK1	ND	ug/L	0.20	0.089	
Total PCB's (Summation)	B076081-BLK1	ND	ug/L	0.20	0.10	
TCMX (Surrogate)	B076081-BLK1	91.3	%	60 - 130 (LCL - UCL)		
Decachlorobiphenyl (Surrogate)	B076081-BLK1	75.7	%	60 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B076081										
Aldrin	B076081-BS1	LCS	0.14340	0.15000	ug/L	95.6		60 - 130		
gamma-BHC (Lindane)	B076081-BS1	LCS	0.16051	0.15000	ug/L	107		60 - 130		
4,4'-DDT	B076081-BS1	LCS	0.13075	0.15000	ug/L	87.2		60 - 130		
Dieldrin	B076081-BS1	LCS	0.12209	0.15000	ug/L	81.4		60 - 130		
Endrin	B076081-BS1	LCS	0.16905	0.15000	ug/L	113		60 - 130		
Heptachlor	B076081-BS1	LCS	0.14368	0.15000	ug/L	95.8		60 - 130		
TCMX (Surrogate)	B076081-BS1	LCS	0.25616	0.30000	ug/L	85.4		60 - 130		
Decachlorobiphenyl (Surrogate)	B076081-BS1	LCS	0.48190	0.60000	ug/L	80.3		60 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B076081		Used client sample: N									
Aldrin	MS	2009671-44	ND	0.13804	0.15000	ug/L		92.0		60 - 130	
	MSD	2009671-44	ND	0.14247	0.15000	ug/L	3.2	95.0	30	60 - 130	
gamma-BHC (Lindane)	MS	2009671-44	ND	0.14952	0.15000	ug/L		99.7		60 - 130	
	MSD	2009671-44	ND	0.15828	0.15000	ug/L	5.7	106	30	60 - 130	
4,4'-DDT	MS	2009671-44	ND	0.11181	0.15000	ug/L		74.5		60 - 130	
	MSD	2009671-44	ND	0.12809	0.15000	ug/L	13.6	85.4	30	60 - 130	
Dieldrin	MS	2009671-44	ND	0.11415	0.15000	ug/L		76.1		60 - 130	
	MSD	2009671-44	ND	0.12154	0.15000	ug/L	6.3	81.0	30	60 - 130	
Endrin	MS	2009671-44	ND	0.14961	0.15000	ug/L		99.7		60 - 130	
	MSD	2009671-44	ND	0.16963	0.15000	ug/L	12.5	113	30	60 - 130	
Heptachlor	MS	2009671-44	ND	0.13164	0.15000	ug/L		87.8		60 - 130	
	MSD	2009671-44	ND	0.14129	0.15000	ug/L	7.1	94.2	30	60 - 130	
TCMX (Surrogate)	MS	2009671-44	ND	0.25435	0.30000	ug/L		84.8		60 - 130	
	MSD	2009671-44	ND	0.25467	0.30000	ug/L	0.1	84.9		60 - 130	
Decachlorobiphenyl (Surrogate)	MS	2009671-44	ND	0.39149	0.60000	ug/L		65.2		60 - 130	
	MSD	2009671-44	ND	0.46038	0.60000	ug/L	16.2	76.7		60 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B076077						
Bentazon	B076077-BLK1	ND	ug/L	0.80	0.22	
2,4-D	B076077-BLK1	ND	ug/L	0.40	0.18	
2,4-DB	B076077-BLK1	ND	ug/L	3.0	0.37	
Dalapon	B076077-BLK1	ND	ug/L	5.0	0.31	
Dicamba	B076077-BLK1	ND	ug/L	0.080	0.040	
Dichloroprop	B076077-BLK1	ND	ug/L	0.50	0.11	
Dinoseb	B076077-BLK1	ND	ug/L	0.20	0.057	
MCPA	B076077-BLK1	ND	ug/L	10	6.0	
MCPP	B076077-BLK1	ND	ug/L	10	6.0	
2,4,5-T	B076077-BLK1	ND	ug/L	0.090	0.012	
2,4,5-TP (Silvex)	B076077-BLK1	ND	ug/L	0.070	0.032	
2,4-Dichlorophenylacetic acid (Surrogate)	B076077-BLK1	96.5	%	40 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B076077										
2,4-D	B076077-BS1	LCS	2.5000	2.4000	ug/L	104		50 - 120		
2,4-DB	B076077-BS1	LCS	5.6300	5.4000	ug/L	104		50 - 120		
Dicamba	B076077-BS1	LCS	0.64000	0.60000	ug/L	107		50 - 120		
Dichloroprop	B076077-BS1	LCS	2.5600	2.4000	ug/L	107		50 - 120		
Dinoseb	B076077-BS1	LCS	1.0000	1.2000	ug/L	83.3		50 - 120		
2,4,5-T	B076077-BS1	LCS	0.37000	0.60000	ug/L	61.7		40 - 120		
2,4,5-TP (Silvex)	B076077-BS1	LCS	0.60000	0.60000	ug/L	100		50 - 120		
2,4-Dichlorophenylacetic acid (Surrogate)	B076077-BS1	LCS	4.1700	4.0000	ug/L	104		40 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis (EPA Method 515.1)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: B076077		Used client sample: N									
2,4-D	MS	2009671-11	ND	2.6900	2.4000	ug/L		112		40 - 120	
	MSD	2009671-11	ND	2.4200	2.4000	ug/L	10.6	101	30	40 - 120	
2,4-DB	MS	2009671-11	ND	6.0900	5.4000	ug/L		113		50 - 120	
	MSD	2009671-11	ND	5.4900	5.4000	ug/L	10.4	102	30	50 - 120	
Dicamba	MS	2009671-11	ND	0.67000	0.60000	ug/L		112		50 - 120	
	MSD	2009671-11	ND	0.64000	0.60000	ug/L	4.6	107	30	50 - 120	
Dichloroprop	MS	2009671-11	ND	2.7100	2.4000	ug/L		113		40 - 120	
	MSD	2009671-11	ND	2.3600	2.4000	ug/L	13.8	98.3	30	40 - 120	
Dinoseb	MS	2009671-11	ND	1.0100	1.2000	ug/L		84.2		40 - 130	
	MSD	2009671-11	ND	1.0200	1.2000	ug/L	1.0	85.0	30	40 - 130	
2,4,5-T	MS	2009671-11	ND	0.36000	0.60000	ug/L		60.0		40 - 120	
	MSD	2009671-11	ND	0.35000	0.60000	ug/L	2.8	58.3	30	40 - 120	
2,4,5-TP (Silvex)	MS	2009671-11	ND	0.65000	0.60000	ug/L		108		40 - 120	
	MSD	2009671-11	ND	0.58000	0.60000	ug/L	11.4	96.7	30	40 - 120	
2,4-Dichlorophenylacetic acid (Surrogate	MS	2009671-11	ND	4.2600	4.0000	ug/L		106		40 - 120	
	MSD	2009671-11	ND	4.1100	4.0000	ug/L	3.6	103		40 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075616						
Benzene	B075616-BLK1	ND	ug/L	0.50	0.11	
Bromobenzene	B075616-BLK1	ND	ug/L	0.50	0.15	
Bromochloromethane	B075616-BLK1	ND	ug/L	0.50	0.27	
Bromodichloromethane	B075616-BLK1	ND	ug/L	0.50	0.20	
Bromoform	B075616-BLK1	ND	ug/L	0.50	0.46	
Bromomethane	B075616-BLK1	ND	ug/L	0.50	0.20	
n-Butylbenzene	B075616-BLK1	ND	ug/L	0.50	0.15	
sec-Butylbenzene	B075616-BLK1	ND	ug/L	0.50	0.13	
tert-Butylbenzene	B075616-BLK1	ND	ug/L	0.50	0.18	
Carbon tetrachloride	B075616-BLK1	ND	ug/L	0.50	0.17	
Chlorobenzene	B075616-BLK1	ND	ug/L	0.50	0.14	
Chloroethane	B075616-BLK1	ND	ug/L	0.50	0.17	
Chloroform	B075616-BLK1	ND	ug/L	0.50	0.14	
Chloromethane	B075616-BLK1	ND	ug/L	0.50	0.11	
2-Chlorotoluene	B075616-BLK1	ND	ug/L	0.50	0.14	
4-Chlorotoluene	B075616-BLK1	ND	ug/L	0.50	0.093	
Dibromochloromethane	B075616-BLK1	ND	ug/L	0.50	0.22	
1,2-Dibromo-3-chloropropane	B075616-BLK1	ND	ug/L	1.0	0.89	
1,2-Dibromoethane	B075616-BLK1	ND	ug/L	0.50	0.22	
Dibromomethane	B075616-BLK1	ND	ug/L	0.50	0.23	
1,2-Dichlorobenzene	B075616-BLK1	ND	ug/L	0.50	0.21	
1,3-Dichlorobenzene	B075616-BLK1	ND	ug/L	0.50	0.16	
1,4-Dichlorobenzene	B075616-BLK1	ND	ug/L	0.50	0.15	
Dichlorodifluoromethane	B075616-BLK1	ND	ug/L	0.50	0.15	
1,1-Dichloroethane	B075616-BLK1	ND	ug/L	0.50	0.15	
1,2-Dichloroethane	B075616-BLK1	ND	ug/L	0.50	0.17	
1,1-Dichloroethene	B075616-BLK1	ND	ug/L	0.50	0.27	
cis-1,2-Dichloroethene	B075616-BLK1	ND	ug/L	0.50	0.27	
trans-1,2-Dichloroethene	B075616-BLK1	ND	ug/L	0.50	0.17	
1,2-Dichloropropane	B075616-BLK1	ND	ug/L	0.50	0.15	
1,3-Dichloropropane	B075616-BLK1	ND	ug/L	0.50	0.13	
2,2-Dichloropropane	B075616-BLK1	ND	ug/L	0.50	0.18	
1,1-Dichloropropene	B075616-BLK1	ND	ug/L	0.50	0.19	
cis-1,3-Dichloropropene	B075616-BLK1	ND	ug/L	0.50	0.14	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075616						
trans-1,3-Dichloropropene	B075616-BLK1	ND	ug/L	0.50	0.13	
Total 1,3-Dichloropropene	B075616-BLK1	ND	ug/L	0.50	0.27	
Ethylbenzene	B075616-BLK1	ND	ug/L	0.50	0.15	
Hexachlorobutadiene	B075616-BLK1	ND	ug/L	0.50	0.20	
Isopropylbenzene	B075616-BLK1	ND	ug/L	0.50	0.14	
p-Isopropyltoluene	B075616-BLK1	ND	ug/L	0.50	0.14	
Methylene chloride	B075616-BLK1	ND	ug/L	0.50	0.21	
Methyl t-butyl ether	B075616-BLK1	ND	ug/L	0.50	0.14	
Naphthalene	B075616-BLK1	ND	ug/L	0.50	0.16	
n-Propylbenzene	B075616-BLK1	ND	ug/L	0.50	0.12	
Styrene	B075616-BLK1	ND	ug/L	0.50	0.12	
1,1,1,2-Tetrachloroethane	B075616-BLK1	ND	ug/L	0.50	0.21	
1,1,2,2-Tetrachloroethane	B075616-BLK1	ND	ug/L	0.50	0.17	
Tetrachloroethene	B075616-BLK1	ND	ug/L	0.50	0.23	
Toluene	B075616-BLK1	ND	ug/L	0.50	0.17	
1,2,3-Trichlorobenzene	B075616-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trichlorobenzene	B075616-BLK1	ND	ug/L	0.50	0.15	
1,1,1-Trichloroethane	B075616-BLK1	ND	ug/L	0.50	0.21	
1,1,2-Trichloroethane	B075616-BLK1	ND	ug/L	0.50	0.21	
Trichloroethene	B075616-BLK1	ND	ug/L	0.50	0.19	
Trichlorofluoromethane	B075616-BLK1	ND	ug/L	0.50	0.14	
1,2,3-Trichloropropane	B075616-BLK1	ND	ug/L	1.0	0.78	
1,1,2-Trichloro-1,2,2-trifluoroethane	B075616-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trimethylbenzene	B075616-BLK1	ND	ug/L	0.50	0.17	
1,3,5-Trimethylbenzene	B075616-BLK1	ND	ug/L	0.50	0.14	
Vinyl chloride	B075616-BLK1	ND	ug/L	0.50	0.18	
Total Xylenes	B075616-BLK1	ND	ug/L	0.50	0.47	
Total Trihalomethanes	B075616-BLK1	ND	ug/L	2.0	0.97	
t-Amyl Methyl ether	B075616-BLK1	ND	ug/L	0.50	0.19	
t-Butyl alcohol	B075616-BLK1	ND	ug/L	10	9.4	
Diisopropyl ether	B075616-BLK1	ND	ug/L	0.50	0.36	
Ethyl t-butyl ether	B075616-BLK1	ND	ug/L	0.50	0.32	
p- & m-Xylenes	B075616-BLK1	ND	ug/L	0.50	0.34	
o-Xylene	B075616-BLK1	ND	ug/L	0.50	0.13	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075616						
1,2-Dichloroethane-d4 (Surrogate)	B075616-BLK1	124	%	75 - 125 (LCL - UCL)		
Toluene-d8 (Surrogate)	B075616-BLK1	99.3	%	80 - 120 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	B075616-BLK1	95.7	%	80 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075616										
Benzene	B075616-BS1	LCS	29.120	25.000	ug/L	116		70 - 130		
Bromodichloromethane	B075616-BS1	LCS	31.700	25.000	ug/L	127		70 - 130		
Chlorobenzene	B075616-BS1	LCS	25.390	25.000	ug/L	102		70 - 130		
Chloroethane	B075616-BS1	LCS	27.820	25.000	ug/L	111		70 - 130		
1,4-Dichlorobenzene	B075616-BS1	LCS	25.850	25.000	ug/L	103		70 - 130		
1,1-Dichloroethane	B075616-BS1	LCS	29.660	25.000	ug/L	119		70 - 130		
1,1-Dichloroethene	B075616-BS1	LCS	32.040	25.000	ug/L	128		70 - 130		
Toluene	B075616-BS1	LCS	27.050	25.000	ug/L	108		70 - 130		
Trichloroethene	B075616-BS1	LCS	26.460	25.000	ug/L	106		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B075616-BS1	LCS	12.440	10.000	ug/L	124		75 - 125		
Toluene-d8 (Surrogate)	B075616-BS1	LCS	10.120	10.000	ug/L	101		80 - 120		
4-Bromofluorobenzene (Surrogate)	B075616-BS1	LCS	10.660	10.000	ug/L	107		80 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075616		Used client sample: N									
Benzene	MS	2009671-09	ND	27.470	25.000	ug/L		110		70 - 130	
	MSD	2009671-09	ND	26.470	25.000	ug/L	3.7	106	20	70 - 130	
Bromodichloromethane	MS	2009671-09	ND	32.280	25.000	ug/L		129		70 - 130	
	MSD	2009671-09	ND	30.950	25.000	ug/L	4.2	124	20	70 - 130	
Chlorobenzene	MS	2009671-09	ND	25.540	25.000	ug/L		102		70 - 130	
	MSD	2009671-09	ND	24.850	25.000	ug/L	2.7	99.4	20	70 - 130	
Chloroethane	MS	2009671-09	ND	26.450	25.000	ug/L		106		70 - 130	
	MSD	2009671-09	ND	25.880	25.000	ug/L	2.2	104	20	70 - 130	
1,4-Dichlorobenzene	MS	2009671-09	ND	26.310	25.000	ug/L		105		70 - 130	
	MSD	2009671-09	ND	25.500	25.000	ug/L	3.1	102	20	70 - 130	
1,1-Dichloroethane	MS	2009671-09	ND	28.250	25.000	ug/L		113		70 - 130	
	MSD	2009671-09	ND	27.320	25.000	ug/L	3.3	109	20	70 - 130	
1,1-Dichloroethene	MS	2009671-09	ND	31.230	25.000	ug/L		125		70 - 130	
	MSD	2009671-09	ND	30.430	25.000	ug/L	2.6	122	20	70 - 130	
Toluene	MS	2009671-09	ND	26.800	25.000	ug/L		107		70 - 130	
	MSD	2009671-09	ND	26.050	25.000	ug/L	2.8	104	20	70 - 130	
Trichloroethene	MS	2009671-09	ND	26.760	25.000	ug/L		107		70 - 130	
	MSD	2009671-09	ND	26.140	25.000	ug/L	2.3	105	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	2009671-09	ND	11.860	10.000	ug/L		119		75 - 125	
	MSD	2009671-09	ND	11.430	10.000	ug/L	3.7	114		75 - 125	
Toluene-d8 (Surrogate)	MS	2009671-09	ND	10.070	10.000	ug/L		101		80 - 120	
	MSD	2009671-09	ND	10.000	10.000	ug/L	0.7	100		80 - 120	
4-Bromofluorobenzene (Surrogate)	MS	2009671-09	ND	10.720	10.000	ug/L		107		80 - 120	
	MSD	2009671-09	ND	10.640	10.000	ug/L	0.7	106		80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B076114						
Acenaphthylene	B076114-BLK1	ND	ug/L	0.10	0.031	
Alachlor	B076114-BLK1	ND	ug/L	0.20	0.090	
Anthracene	B076114-BLK1	ND	ug/L	0.10	0.034	
Atraton	B076114-BLK1	ND	ug/L	0.50	0.057	
Atrazine	B076114-BLK1	ND	ug/L	0.30	0.14	
Benzo[a]anthracene	B076114-BLK1	ND	ug/L	0.20	0.044	
Benzo[b]fluoranthene	B076114-BLK1	ND	ug/L	0.30	0.034	
Benzo[k]fluoranthene	B076114-BLK1	ND	ug/L	0.30	0.072	
Benzo[a]pyrene	B076114-BLK1	ND	ug/L	0.10	0.050	
Benzo[g,h,i]perylene	B076114-BLK1	ND	ug/L	0.30	0.065	
Benzyl butyl phthalate	B076114-BLK1	ND	ug/L	4.0	0.047	
delta-BHC	B076114-BLK1	ND	ug/L	0.20	0.048	
gamma-BHC (Lindane)	B076114-BLK1	ND	ug/L	0.20	0.063	
bis(2-Ethylhexyl)phthalate	B076114-BLK1	ND	ug/L	3.0	0.030	
Bromacil	B076114-BLK1	ND	ug/L	0.50	0.043	
Chrysene	B076114-BLK1	ND	ug/L	0.30	0.060	
Diazinon	B076114-BLK1	ND	ug/L	0.20	0.080	
Dibenzo[a,h]anthracene	B076114-BLK1	ND	ug/L	0.30	0.051	
Di(2-ethylhexyl)adipate	B076114-BLK1	ND	ug/L	1.0	0.025	
Dimethoate	B076114-BLK1	ND	ug/L	2.0	0.050	
Dimethyl phthalate	B076114-BLK1	ND	ug/L	1.0	0.034	
Di-n-butyl phthalate	B076114-BLK1	ND	ug/L	1.0	0.063	
Fluorene	B076114-BLK1	ND	ug/L	0.20	0.029	
Hexachlorobenzene	B076114-BLK1	ND	ug/L	0.20	0.029	
Hexachlorocyclopentadiene	B076114-BLK1	ND	ug/L	1.0	0.12	
Indeno[1,2,3-cd]pyrene	B076114-BLK1	ND	ug/L	0.30	0.032	
Methoxychlor	B076114-BLK1	ND	ug/L	0.30	0.034	
Metolachlor	B076114-BLK1	ND	ug/L	0.50	0.056	
Metribuzin	B076114-BLK1	ND	ug/L	0.50	0.048	
Molinate	B076114-BLK1	ND	ug/L	0.50	0.036	
Phenanthrene	B076114-BLK1	ND	ug/L	0.10	0.020	
Prometon	B076114-BLK1	ND	ug/L	0.50	0.11	
Prometryn	B076114-BLK1	ND	ug/L	0.50	0.045	
Pyrene	B076114-BLK1	ND	ug/L	0.10	0.040	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B076114						
Secbumeton	B076114-BLK1	ND	ug/L	0.50	0.079	
Simazine	B076114-BLK1	ND	ug/L	0.30	0.066	
Terbutryn	B076114-BLK1	ND	ug/L	0.50	0.050	
Thiobencarb	B076114-BLK1	ND	ug/L	0.50	0.044	
Perylene-d12 (Surrogate)	B076114-BLK1	32.0	%	60 - 140 (LCL - UCL)		S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	B076114-BLK1	50.4	%	70 - 130 (LCL - UCL)		S09
Triphenylphosphate (Surrogate)	B076114-BLK1	130	%	70 - 130 (LCL - UCL)		
Pyrene-d10 (Surrogate)	B076114-BLK1	93.4	%	70 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B076114										
Acenaphthylene	B076114-BS1	LCS	0.90000	2.0000	ug/L	45.0		60 - 120		L01
Alachlor	B076114-BS1	LCS	2.3600	2.0000	ug/L	118		60 - 120		
Atrazine	B076114-BS1	LCS	1.3100	2.0000	ug/L	65.5		60 - 120		
Benzo[a]pyrene	B076114-BS1	LCS	1.7000	2.0000	ug/L	85.0		60 - 120		
Chrysene	B076114-BS1	LCS	1.4600	2.0000	ug/L	73.0		60 - 120		
Pyrene	B076114-BS1	LCS	1.9800	2.0000	ug/L	99.0		60 - 120		
Simazine	B076114-BS1	LCS	1.7000	2.0000	ug/L	85.0		60 - 120		
Perylene-d12 (Surrogate)	B076114-BS1	LCS	1.8200	5.0000	ug/L	36.4		60 - 140		S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	B076114-BS1	LCS	2.5000	5.0000	ug/L	50.0		70 - 130		S09
Triphenylphosphate (Surrogate)	B076114-BS1	LCS	6.3500	5.0000	ug/L	127		70 - 130		
Pyrene-d10 (Surrogate)	B076114-BS1	LCS	4.9500	5.0000	ug/L	99.0		70 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
QC Batch ID: B076114		Used client sample: N									
Acenaphthylene	MS	2009671-35	ND	0.87000	2.0000	ug/L		43.5		50 - 120	Q03
	MSD	2009671-35	ND	0.88000	2.0000	ug/L	1.1	44.0	30	50 - 120	Q03
Alachlor	MS	2009671-35	ND	2.6300	2.0000	ug/L		132		50 - 120	Q03
	MSD	2009671-35	ND	2.3000	2.0000	ug/L	13.4	115	30	50 - 120	
Atrazine	MS	2009671-35	ND	1.2800	2.0000	ug/L		64.0		50 - 120	
	MSD	2009671-35	ND	1.1500	2.0000	ug/L	10.7	57.5	30	50 - 120	
Benzo[a]pyrene	MS	2009671-35	ND	1.5600	2.0000	ug/L		78.0		50 - 120	
	MSD	2009671-35	ND	1.5500	2.0000	ug/L	0.6	77.5	30	50 - 120	
Chrysene	MS	2009671-35	ND	1.5200	2.0000	ug/L		76.0		50 - 120	
	MSD	2009671-35	ND	1.9200	2.0000	ug/L	23.3	96.0	30	50 - 120	
Pyrene	MS	2009671-35	ND	1.9700	2.0000	ug/L		98.5		50 - 120	
	MSD	2009671-35	ND	1.9100	2.0000	ug/L	3.1	95.5	30	50 - 120	
Simazine	MS	2009671-35	ND	1.7500	2.0000	ug/L		87.5		50 - 120	
	MSD	2009671-35	ND	1.5700	2.0000	ug/L	10.8	78.5	30	50 - 120	
Perylene-d12 (Surrogate)	MS	2009671-35	ND	1.5900	5.0000	ug/L		31.8		60 - 140	S09
	MSD	2009671-35	ND	1.6300	5.0000	ug/L	2.5	32.6		60 - 140	S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	MS	2009671-35	ND	2.5100	5.0000	ug/L		50.2		70 - 130	S09
	MSD	2009671-35	ND	2.4500	5.0000	ug/L	2.4	49.0		70 - 130	S09
Triphenylphosphate (Surrogate)	MS	2009671-35	ND	6.6600	5.0000	ug/L		133		70 - 130	S09
	MSD	2009671-35	ND	4.9300	5.0000	ug/L	29.9	98.6		70 - 130	
Pyrene-d10 (Surrogate)	MS	2009671-35	ND	4.9400	5.0000	ug/L		98.8		70 - 130	
	MSD	2009671-35	ND	4.9200	5.0000	ug/L	0.4	98.4		70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075919						
Oil and Grease	B075919-BLK1	ND	mg/L	5.0	0.66	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Laboratory Control Sample

								Control Limits		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab Quals
Oil and Grease	QC Batch ID: B075919									
	B075919-BS1	LCS	40.900	40.300	mg/L	101		78 - 114		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

EPA Method 1664

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075919		Used client sample: N									
Oil and Grease	DUP	2009671-08	ND	ND		mg/L				18	
	MS	2009671-08	ND	41.600	40.300	mg/L		103		78 - 114	
	MSD	2009671-08	ND	41.700	40.300	mg/L	0.2	103	18	78 - 114	

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B^D0186						
Total Nitrogen	B^D0186-BLK1	ND	mg/L	0.30	0.10	
QC Batch ID: B075549						
MBAS	B075549-BLK1	ND	mg/L	0.10	0.025	
QC Batch ID: B075611						
Chloride	B075611-BLK1	ND	mg/L	0.50	0.13	
Nitrate as N	B075611-BLK1	ND	mg/L	0.10	0.024	
Sulfate	B075611-BLK1	ND	mg/L	1.0	0.14	
QC Batch ID: B075800						
Total Suspended Solids (Glass Fiber)	B075800-BLK1	ND	mg/L	0.50	0.50	
QC Batch ID: B075881						
Total Dissolved Solids @ 180 C	B075881-BLK1	ND	mg/L	6.7	3.3	
QC Batch ID: B076644						
Total Kjeldahl Nitrogen	B076644-BLK1	ND	mg/L	0.20	0.067	
QC Batch ID: B076645						
Total Phosphorus	B076645-BLK1	ND	mg/L	0.050	0.017	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075549										
MBAS	B075549-BS1	LCS	0.19370	0.20000	mg/L	96.8		85 - 115		
QC Batch ID: B075611										
Chloride	B075611-BS1	LCS	51.942	50.000	mg/L	104		90 - 110		
Nitrate as N	B075611-BS1	LCS	5.1070	5.0000	mg/L	102		90 - 110		
Sulfate	B075611-BS1	LCS	104.15	100.00	mg/L	104		90 - 110		
QC Batch ID: B075881										
Total Dissolved Solids @ 180 C	B075881-BS1	LCS	560.00	586.00	mg/L	95.6		90 - 110		
QC Batch ID: B076644										
Total Kjeldahl Nitrogen	B076644-BS1	LCS	2.0818	2.0000	mg/L	104		90 - 110		
QC Batch ID: B076645										
Total Phosphorus	B076645-BS1	LCS	0.99090	1.0000	mg/L	99.1		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075549		Used client sample: N									
MBAS	DUP	2010954-05	ND	ND		mg/L			20		
	MS	2010954-05	ND	0.43940	0.40000	mg/L		110		80 - 120	
	MSD	2010954-05	ND	0.45680	0.40000	mg/L	3.9	114	20	80 - 120	
QC Batch ID: B075611		Used client sample: N									
Chloride	DUP	2011111-01RE1	362.57	367.77		mg/L	1.4		10		
	MS	2011111-01RE1	362.57	463.94	101.01	mg/L		100		80 - 120	
	MSD	2011111-01RE1	362.57	464.28	101.01	mg/L	0.1	101	10	80 - 120	
Nitrate as N	DUP	2011111-01RE1	2.7140	2.7560		mg/L	1.5		10		
	MS	2011111-01RE1	2.7140	13.440	10.101	mg/L		106		80 - 120	
	MSD	2011111-01RE1	2.7140	13.451	10.101	mg/L	0.1	106	10	80 - 120	
Sulfate	DUP	2011111-01RE1	95.622	96.620		mg/L	1.0		10		
	MS	2011111-01RE1	95.622	321.28	202.02	mg/L		112		80 - 120	
	MSD	2011111-01RE1	95.622	321.46	202.02	mg/L	0.1	112	10	80 - 120	
QC Batch ID: B075800		Used client sample: N									
Total Suspended Solids (Glass Fiber)	DUP	2010948-02	300.00	300.00		mg/L	0		10		
QC Batch ID: B075881		Used client sample: N									
Total Dissolved Solids @ 180 C	DUP	2011014-01	14100	14200		mg/L	0.7		10		
QC Batch ID: B076644		Used client sample: N									
Total Kjeldahl Nitrogen	DUP	2011406-04	0.10610	0.087200		mg/L	19.6		20		J
	MS	2011406-04	0.10610	2.0990	2.0000	mg/L		99.6		90 - 110	
	MSD	2011406-04	0.10610	1.9382	2.0000	mg/L	8.0	91.6	20	90 - 110	
QC Batch ID: B076645		Used client sample: N									
Total Phosphorus	DUP	2011406-04	ND	ND		mg/L			20		
	MS	2011406-04	ND	1.0552	1.0000	mg/L		106		80 - 120	
	MSD	2011406-04	ND	1.0131	1.0000	mg/L	4.1	101	20	80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B075819						
Total Recoverable Iron	B075819-BLK1	ND	ug/L	50	30	
Total Recoverable Manganese	B075819-BLK1	ND	ug/L	10	4.0	
QC Batch ID: B075879						
Total Recoverable Mercury	B075879-BLK1	ND	ug/L	0.20	0.022	
QC Batch ID: B075898						
Total Recoverable Antimony	B075898-BLK1	ND	ug/L	2.0	0.11	
Total Recoverable Arsenic	B075898-BLK1	ND	ug/L	2.0	0.70	
Total Recoverable Barium	B075898-BLK1	ND	ug/L	1.0	0.21	
Total Recoverable Beryllium	B075898-BLK1	ND	ug/L	1.0	0.14	
Total Recoverable Cadmium	B075898-BLK1	ND	ug/L	1.0	0.11	
Total Recoverable Chromium	B075898-BLK1	ND	ug/L	3.0	0.50	
Total Recoverable Cobalt	B075898-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Copper	B075898-BLK1	0.34900	ug/L	2.0	0.22	J
Total Recoverable Lead	B075898-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Molybdenum	B075898-BLK1	ND	ug/L	1.0	0.11	
Total Recoverable Nickel	B075898-BLK1	ND	ug/L	2.0	0.19	
Total Recoverable Selenium	B075898-BLK1	ND	ug/L	2.0	0.19	
Total Recoverable Silver	B075898-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Thallium	B075898-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Vanadium	B075898-BLK1	ND	ug/L	3.0	0.78	
Total Recoverable Zinc	B075898-BLK1	ND	ug/L	10	1.7	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B075819										
Total Recoverable Iron	B075819-BS1	LCS	990.43	1000.0	ug/L	99.0		85 - 115		
Total Recoverable Manganese	B075819-BS1	LCS	496.21	500.00	ug/L	99.2		85 - 115		
QC Batch ID: B075879										
Total Recoverable Mercury	B075879-BS1	LCS	0.99750	1.0000	ug/L	99.8		85 - 115		
QC Batch ID: B075898										
Total Recoverable Antimony	B075898-BS1	LCS	42.747	40.000	ug/L	107		85 - 115		
Total Recoverable Arsenic	B075898-BS1	LCS	107.41	100.00	ug/L	107		85 - 115		
Total Recoverable Barium	B075898-BS1	LCS	43.368	40.000	ug/L	108		85 - 115		
Total Recoverable Beryllium	B075898-BS1	LCS	44.435	40.000	ug/L	111		85 - 115		
Total Recoverable Cadmium	B075898-BS1	LCS	44.983	40.000	ug/L	112		85 - 115		
Total Recoverable Chromium	B075898-BS1	LCS	43.049	40.000	ug/L	108		85 - 115		
Total Recoverable Cobalt	B075898-BS1	LCS	43.146	40.000	ug/L	108		85 - 115		
Total Recoverable Copper	B075898-BS1	LCS	110.72	100.00	ug/L	111		85 - 115		
Total Recoverable Lead	B075898-BS1	LCS	109.75	100.00	ug/L	110		85 - 115		
Total Recoverable Molybdenum	B075898-BS1	LCS	40.192	40.000	ug/L	100		85 - 115		
Total Recoverable Nickel	B075898-BS1	LCS	109.02	100.00	ug/L	109		85 - 115		
Total Recoverable Selenium	B075898-BS1	LCS	109.50	100.00	ug/L	110		85 - 115		
Total Recoverable Silver	B075898-BS1	LCS	42.271	40.000	ug/L	106		85 - 115		
Total Recoverable Thallium	B075898-BS1	LCS	42.372	40.000	ug/L	106		85 - 115		
Total Recoverable Vanadium	B075898-BS1	LCS	40.861	40.000	ug/L	102		85 - 115		
Total Recoverable Zinc	B075898-BS1	LCS	112.56	100.00	ug/L	113		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075819		Used client sample: N									
Total Recoverable Iron	DUP	2011121-01	ND	ND		ug/L			20		
	MS	2011121-01	ND	1026.8	1000.0	ug/L		103		75 - 125	
	MSD	2011121-01	ND	1055.3	1000.0	ug/L	2.7	106	20	75 - 125	
Total Recoverable Manganese	DUP	2011121-01	21.243	20.892		ug/L	1.7		20		
	MS	2011121-01	21.243	504.01	500.00	ug/L		96.6		75 - 125	
	MSD	2011121-01	21.243	515.33	500.00	ug/L	2.2	98.8	20	75 - 125	
QC Batch ID: B075879		Used client sample: N									
Total Recoverable Mercury	DUP	2010862-01	ND	ND		ug/L			20		
	MS	2010862-01	ND	1.0675	1.0000	ug/L		107		70 - 130	
	MSD	2010862-01	ND	1.0775	1.0000	ug/L	0.9	108	20	70 - 130	
QC Batch ID: B075898		Used client sample: N									
Total Recoverable Antimony	DUP	2011043-01	0.18400	0.16100		ug/L	13.3		20		J
	MS	2011043-01	0.18400	43.304	40.000	ug/L		108		70 - 130	
	MSD	2011043-01	0.18400	43.159	40.000	ug/L	0.3	107	20	70 - 130	
Total Recoverable Arsenic	DUP	2011043-01	13.535	11.246		ug/L	18.5		20		
	MS	2011043-01	13.535	121.28	100.00	ug/L		108		70 - 130	
	MSD	2011043-01	13.535	121.12	100.00	ug/L	0.1	108	20	70 - 130	
Total Recoverable Barium	DUP	2011043-01	1348.5	1360.3		ug/L	0.9		20		
	MS	2011043-01	1348.5	1399.4	40.000	ug/L		127		70 - 130	
	MSD	2011043-01	1348.5	1330.1	40.000	ug/L	5.1	-46.0	20	70 - 130	A03
Total Recoverable Beryllium	DUP	2011043-01	ND	ND		ug/L			20		
	MS	2011043-01	ND	38.174	40.000	ug/L		95.4		70 - 130	
	MSD	2011043-01	ND	38.389	40.000	ug/L	0.6	96.0	20	70 - 130	
Total Recoverable Cadmium	DUP	2011043-01	ND	ND		ug/L			20		
	MS	2011043-01	ND	39.941	40.000	ug/L		99.9		70 - 130	
	MSD	2011043-01	ND	38.574	40.000	ug/L	3.5	96.4	20	70 - 130	
Total Recoverable Chromium	DUP	2011043-01	0.53800	0.52100		ug/L	3.2		20		J
	MS	2011043-01	0.53800	39.635	40.000	ug/L		97.7		70 - 130	
	MSD	2011043-01	0.53800	38.206	40.000	ug/L	3.7	94.2	20	70 - 130	
Total Recoverable Cobalt	DUP	2011043-01	4.2760	4.4370		ug/L	3.7		20		
	MS	2011043-01	4.2760	39.738	40.000	ug/L		88.7		70 - 130	
	MSD	2011043-01	4.2760	39.584	40.000	ug/L	0.4	88.3	20	70 - 130	
Total Recoverable Copper	DUP	2011043-01	3.1070	3.3680		ug/L	8.1		20		
	MS	2011043-01	3.1070	107.35	100.00	ug/L		104		70 - 130	
	MSD	2011043-01	3.1070	106.28	100.00	ug/L	1.0	103	20	70 - 130	
Total Recoverable Lead	DUP	2011043-01	ND	ND		ug/L			20		
	MS	2011043-01	ND	104.66	100.00	ug/L		105		70 - 130	
	MSD	2011043-01	ND	100.10	100.00	ug/L	4.5	100	20	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Metals Analysis

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B075898		Used client sample: N									
Total Recoverable Molybdenum	DUP	2011043-01	16.074	16.646		ug/L	3.5		20		
	MS	2011043-01	16.074	65.575	40.000	ug/L		124		70 - 130	
	MSD	2011043-01	16.074	64.112	40.000	ug/L	2.3	120	20	70 - 130	
Total Recoverable Nickel	DUP	2011043-01	12.222	12.381		ug/L	1.3		20		
	MS	2011043-01	12.222	97.164	100.00	ug/L		84.9		70 - 130	
	MSD	2011043-01	12.222	96.248	100.00	ug/L	0.9	84.0	20	70 - 130	
Total Recoverable Selenium	DUP	2011043-01	20.708	22.158		ug/L	6.8		20		
	MS	2011043-01	20.708	128.01	100.00	ug/L		107		70 - 130	
	MSD	2011043-01	20.708	127.20	100.00	ug/L	0.6	106	20	70 - 130	
Total Recoverable Silver	DUP	2011043-01	ND	ND		ug/L			20		
	MS	2011043-01	ND	38.649	40.000	ug/L		96.6		70 - 130	
	MSD	2011043-01	ND	38.418	40.000	ug/L	0.6	96.0	20	70 - 130	
Total Recoverable Thallium	DUP	2011043-01	ND	ND		ug/L			20		
	MS	2011043-01	ND	41.257	40.000	ug/L		103		70 - 130	
	MSD	2011043-01	ND	39.906	40.000	ug/L	3.3	99.8	20	70 - 130	
Total Recoverable Vanadium	DUP	2011043-01	1.1680	1.5310		ug/L	26.9		20		J,A02
	MS	2011043-01	1.1680	41.769	40.000	ug/L		102		70 - 130	
	MSD	2011043-01	1.1680	40.385	40.000	ug/L	3.4	98.0	20	70 - 130	
Total Recoverable Zinc	DUP	2011043-01	2.6700	2.8210		ug/L	5.5		20		J
	MS	2011043-01	2.6700	99.325	100.00	ug/L		96.7		70 - 130	
	MSD	2011043-01	2.6700	98.856	100.00	ug/L	0.5	96.2	20	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 05/01/2020 16:27
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Sarah Battelle

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A02	The difference between duplicate readings is less than the quantitation limit.
A03	The sample concentration was more than 4 times the spike level.
A07	Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
L01	The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
Q03	Matrix spike recovery(s) was(were) not within the control limits.
S09	The surrogate recovery for this compound was not within the control limits.
V11	The Continuing Calibration Verification (CCV) recovery was not within established control limits.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

[illegible]

**GROUNDWATER MONITORING PROGRAM
WELL DATA SHEET**

Site Name.:	<u>COTTONWOOD</u>	Project No.:	<u>5020-1016</u>
Well I.D.:	<u>WINDHOG #21</u>	Sampling Date:	<u>10/1/20</u>
Collected By:	<u>KW</u>	Purge start Time:	<u>1030</u>
Casing Diameter (inches):	<u>-</u>	Purge Stop time:	<u>1050</u>
Starting Water Level:	<u>-</u>	Sampling Time:	<u>1050</u>
Total Depth (feet):	<u>-</u>	Ending Water Level (feet):	<u>-</u>
Water column (feet):	<u>-</u>	Total Purged (gallons):	<u>20</u>
Screen Length (feet):	<u>-</u>	PID/FID Reading:	<u>-</u>
Purge Volume (gallons):	<u>-</u>	Duplicate Sample:	YES ☐ NO ☒
Horiba Model S/N:	<u>052</u>		

GALLONS PURGED	WATER LEVEL	pH	CONDUCTIVITY ms/cm	TURBIDITY NTU	D.O. mg/L	TEMPERATURE °C	O.R.P. mV
FLUSHED	007	DIRTY WATER AT 7"					
1	-	8.20	0.735	5.9	-	29.27	153
4	-	8.09	0.730	239	-	26.88	163
7	-	7.52	0.782	002	-	25.97	177
10	-	7.18	1.83	"	-	25.63	208
12	-	7.11	2.28	"	-	25.01	211
14	-	7.07	2.39	244	-	24.73	212
16	-	7.06	2.43	70	-	24.62	214
18	-	7.06	2.44	79	-	24.51	213
20	-	7.07	2.45	72	-	24.40	213

Purge Sampling Rates:

Well condition: SAMPLE PORT ON 4" PIPE
WELL WAS DRY

Additional Info/Comments:

Name: KYLE WILKINS

Signature: [Signature]

**GROUNDWATER MONITORING PROGRAM
WELL DATA SHEET**

Site Name.: 41 COTTONWOOD
Well I.D.: IVANHOE #8
Collected By: KW
Casing Diameter (inches): —
Starting Water Level: —
Total Depth (feet): —
Water column (feet): —
Screen Length (feet): —
Purge Volume (gallons): —
Horiba Model S/N: U52

Project No.: 2020.1016
Sampling Date: 10/1/20
Purge start Time: 945
Purge Stop time: 958
Sampling Time: 1000
Ending Water Level (feet): —
Total Purged (gallons): 10
PID/FID Reading: —
Duplicate Sample: YES ☐ NO ☒

GALLONS PURGED	WATER LEVEL	pH	CONDUCTIVITY ms/cm	TURBIDITY NTU	D.O. mg/L	TEMPERATURE °C	O.R.P. mV
FLUSHED OUT DIRTY WATER AFTER REMOVING							
PRESSURE GAUGE. PUMP IS ACTIVELY RUNNING							
1	—	6.45	2.39	0.0	—	24.02	256
2	—	6.53	2.38	2.6	—	22.02	247
4	—	6.56	2.40	0.3	—	21.26	247
6	—	6.54	2.43	0.7	—	21.01	245
8	—	6.57	2.44	0.8	—	20.88	241
10	—	6.56	2.45	1.3	—	20.83	244

Purge Sampling Rates:

Well condition: REMOVED PRESSURE GAUGE & SAMPLED FROM
VALVE ON 4" PIPE

Additional Info/Comments:

Name: Kyle W. Williams

Signature: [Signature]

GROUNDWATER MONITORING PROGRAM WELL DATA SHEET

Site Name.: COTTONWOOD
Well I.D.: LAKE #11
Collected By: NR
Casing Diameter (inches): 12
Starting Water Level: 5.95
Total Depth (feet): 21.30
Water column (feet): 15.35
Screen Length (feet): -
Purge Volume (gallons): 135.26
Horiba Model S/N: U-52/DLLCYV06

Project No.: S020.1016
Sampling Date: 10/1/2020
Purge start Time: 0924
Purge Stop time: 1019
Sampling Time: 1040
Ending Water Level (feet): 7.89
Total Purged (gallons): 155
PID/FID Reading: N/A
Duplicate Sample: YES ☐ NO ☒

* BLANKS COLLECTED HERE *

GALLONS PURGED	WATER LEVEL	pH	CONDUCTIVITY ms/cm	TURBIDITY NTU	D.O. mg/L	TEMPERATURE °C	O.R.P. mV
30	7.80	6.73	3.15	9.6	4.62	23.86	132
60	7.83	7.95	3.06	8.9	3.53	23.60	-77
90	7.86	7.87	2.97	5.9	2.19	23.75	-88
120	7.88	7.76	2.93	4.8	1.34	23.75	-104
135	7.88	7.68	2.93	4.9	1.38	23.44	-96
145	7.89	7.72	2.92	4.7	1.42	23.30	-93
155	7.89	7.71	2.92	4.7	1.36	23.29	-89

Purge Sampling Rates: PURGE WELL AT APPROX 3 GPM USING GRUNDFOS PUMP WITH
EZ-Reel. SAMPLE COLLECTED USING NEW 1 1/2" DISPOSABLE BAYLER

Well condition: POOR - NO LID, PROTECTIVE METAL CASING HAS RUSTED AWAY ON ONE
SIDE, APPROX 17" X 19"

Additional Info/Comments: SUNNY, CLEAR, WARM

Name: NICHOLAS REASON

Signature: [Signature]

Geo-Logic ASSOCIATES

FIELD CALIBRATION DOCUMENTATION FORM

LOCATION (Site/Facility Name) Coronado

PROJECT NAME / NUMBER Size, 1016

Instrument Make/Model # <u>HORIBA U-52</u> <u>BUCKING</u>						
Date/Time <u>10/1/2009</u> <u>0900</u>	pH	Electrical Conductivity (µMhos/cm) (4.49 mg/Kg)	Turbidity (NTU) (0)	DO (mg/L or %)	Guidance Remarks	Comments
Pre-Cal	3.92	4.43	0.1	6.67		
Calibration	4.00	4.49	0.0	9.03		
Calibration Successful? (Y/N)	Y				enter YES or NO	
Satisfies Protocol?	Y				Did calibration meet criteria in the sampling protocol? (Y or N)	
Calibration by	ML				Signature or initials	
Physical Condition of Unit					Good	

Geo-Logic ASSOCIATES

FIELD CALIBRATION DOCUMENTATION FORM

LOCATION (Site/Facility Name) Coto Noro PROJECT NAME / NUMBER 5020.1014

Instrument Make/Model # HOBI V-52

Date/Time	pH	Electrical Conductivity (μ Mhos/cm) (4.49 mg/Kg)	Turbidity (NTU) (0)	DO (mg/L or %)	Guidance Remarks	Comments
6/1/20 900						
Pre. Cal	3.85	4,41	0.0	9.56		
Calibration	4.00	4,47	0.0	8.44		
Calibration Successful? (Y/N)	Y				enter YES or NO	
Satisfies Protocol?	Y				Did calibration meet criteria in the sampling protocol? (Y or N)	
Calibration by	LN				Signature or initials	
Physical Condition of Unit					Good	



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 10/21/2020

Kyle Welchans

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Client Project: S020.1016
BCL Project: Cottonwood Sand Mine Project
BCL Work Order: 2028653
Invoice ID: B395439

Enclosed are the results of analyses for samples received by the laboratory on 10/1/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	4
Laboratory / Client Sample Cross Reference.....	7

Sample Results

2028653-01 - Ivanhoe #11

Organochlorine Pesticides and PCB's (EPA Method 508).....	8
Organic Analysis (EPA Method 515.1).....	9
Volatile Organic Analysis (EPA Method 524.2).....	10
Organic Analysis by Liquid Solids Extraction (EPA Method 525.2).....	13
EPA Method 1664.....	15
Water Analysis (General Chemistry).....	16
Metals Analysis.....	17

2028653-02 - Lake #11

Organochlorine Pesticides and PCB's (EPA Method 508).....	18
Organic Analysis (EPA Method 515.1).....	19
Volatile Organic Analysis (EPA Method 524.2).....	20
Organic Analysis by Liquid Solids Extraction (EPA Method 525.2).....	23
EPA Method 1664.....	25
Water Analysis (General Chemistry).....	26
Metals Analysis.....	27

2028653-03 - Ivanhoe #8

Organochlorine Pesticides and PCB's (EPA Method 508).....	28
Organic Analysis (EPA Method 515.1).....	29
Volatile Organic Analysis (EPA Method 524.2).....	30
Organic Analysis by Liquid Solids Extraction (EPA Method 525.2).....	33
EPA Method 1664.....	35
Water Analysis (General Chemistry).....	36
Metals Analysis.....	37

2028653-04 - QCAB

Volatile Organic Analysis (EPA Method 524.2).....	38
---	----

2028653-05 - QCTB

Volatile Organic Analysis (EPA Method 524.2).....	41
---	----

Quality Control Reports

Organochlorine Pesticides and PCB's (EPA Method 508)

Method Blank Analysis.....	44
Laboratory Control Sample.....	45
Precision and Accuracy.....	46

Organic Analysis (EPA Method 515.1)

Method Blank Analysis.....	47
Laboratory Control Sample.....	48
Precision and Accuracy.....	49

Volatile Organic Analysis (EPA Method 524.2)

Method Blank Analysis.....	50
Laboratory Control Sample.....	53
Precision and Accuracy.....	54

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Method Blank Analysis.....	55
Laboratory Control Sample.....	57
Precision and Accuracy.....	58

EPA Method 1664

Method Blank Analysis.....	59
Laboratory Control Sample.....	60
Precision and Accuracy.....	61

Water Analysis (General Chemistry)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Method Blank Analysis..... 62

Laboratory Control Sample..... 63

Precision and Accuracy..... 64

Metals Analysis

Method Blank Analysis..... 65

Laboratory Control Sample..... 66

Precision and Accuracy..... 67

Notes

Notes and Definitions..... 69



LABORATORIES, INC.

4100 Atlas Ct. - Bakersfield, CA 93308 - 661.327.4911 - Fax: 661.327.1918 - www.bclabs.com

Chain of Custody Form

Page 1 of 1

[illegible]

*For Drinking Water, mark "EDT - yes or no." If marked no, BCL will not upload at a future date.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2028653 Page 2 of 3

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 of 2							
Submission #: 20-28653 (20-28654)											
SHIPPING INFORMATION			SHIPPING CONTAINER		FREE LIQUID						
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐			Ice Chest ☒ None ☐ Box ☐		YES ☐ NO ☐						
BC Lab Field Service ☒ Other ☐ (Specify) _____			Other ☐ (Specify) _____		W / S						
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:											
Custody Seals: Ice Chest ☐ Containers ☐ None ☒ Comments:											
Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐											
All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐											
COC Received ☒ YES ☐ NO		Emissivity: 0.98 Container: PE Thermometer ID: 208		Date/Time 10/1/17 47							
		Temperature: (A) 1.7 °C / (C) 1.5 °C		Analyst Init UP							
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES		DE	DE	DE							
4oz / 8oz / 16oz PE UNPRES											
2oz Cr ⁴											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz		F	F								
PT CYANIDE											
PT NITROGEN FORMS		AP	G								
PT TOTAL SULFIDE											
2oz. NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON			H								
PT CHEMICAL OXYGEN DEMAND											
PLA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK						AB					
40ml VOA VIAL			AB		AB						
QT EPA 1664			I								
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL		(AB)	(AB)	(AB)							
40 ml VOA VIAL- 504											
QT EPA 504/608/8080											
QT EPA 515.1/8150											
QT EPA 525 020			J								
QT EPA 525 TRAVEL BLANK											
40ml EPA 547 024			K								
40ml EPA 531.1											
8oz EPA 548 028			LM								
QT EPA 549											
QT EPA 6015M											
QT EPA 6270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOIL SLEEVE											
PCE VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments: -4A Q CAB, -5AB QCTB
Sample Numbering Completed By: UP
A = Actual / C = Corrected

Date/Time: 10/1/2013

Rev 21 05/23/2016

ISOPFOCocWoolPerfecLAB_DCSFORMSISAMRECrev 201

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2028653 Page 3 of 3

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 2 Of 2							
Submission #: 20-28653(20-28654)											
SHIPPING INFORMATION			SHIPPING CONTAINER		FREE LIQUID						
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐ BC Lab Field Service ☒ Other ☐ (Specify) _____			Ice Chest ☒ None ☐ Box ☐ Other ☐ (Specify) _____		YES ☐ NO ☐ W / S						
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: _____											
Custody Seals Ice Chest ☐ Containers ☐ None ☒ Comments: _____											
Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐											
All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐											
COC Received ☒ YES ☐ NO		Emissivity: 0.98 Container: PE Thermometer ID: 208		Date/Time: 9/10/17 1747							
		Temperature: (A) 1.4 °C / (C) 1.2 °C		Analyst Init: [Signature]							
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES											
4oz / 8oz / 16oz PE UNPRES											
2oz Cr ⁶											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz				F							
PT CYANIDE											
PT NITROGEN FORMS		G		G							
PT TOTAL SULFIDE											
2oz NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON		H		H							
PT CHEMICAL OXYGEN DEMAND											
PIA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL		ABL		ABL							
QT EPA 1664		I		I							
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40 ml VOA VIAL- 504											
QT EPA 508G08/8080											
QT EPA 515.1/8150											
QT EPA 525 020		JKL									
QT EPA 525 TRAVEL BLANK											
40ml EPA 547 024		ML		J							
40ml EPA 531.1											
8oz EPA 543 028		NOR									
QT EPA 549 028		MN		KL							
QT EPA 8015M											
QT EPA 8276											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOIL SLEEVE											
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments:

Sample Numbering Completed By: VP

Date/Time: 9/2 1756

Rev 21

A = Actual / C = Corrected

BSWPFDec17ModPerfectEAB_S0C5FORMS

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2028653-01	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 10:50
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Ivanhoe #11	Lab Matrix:	Water
	Sampled By:	Nick Reason	Sample Type:	Groundwater
2028653-02	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 10:40
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Lake #11	Lab Matrix:	Water
	Sampled By:	Nick Reason	Sample Type:	Groundwater
2028653-03	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 10:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Ivanhoe #8	Lab Matrix:	Water
	Sampled By:	Nick Reason	Sample Type:	Groundwater
2028653-04	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 00:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	QCAB	Lab Matrix:	Water
	Sampled By:	Nick Reason	Sample Type:	Water
2028653-05	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 00:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	QCTB	Lab Matrix:	Water
	Sampled By:	Nick Reason	Sample Type:	Blank Water

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organochlorine Pesticides and PCB's (EPA Method 508)

BCL Sample ID: 2028653-01		Client Sample Name: Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ug/L	0.0050	0.00095	EPA-508	ND		1
alpha-BHC	ND	ug/L	0.0050	0.00050	EPA-508	ND		1
beta-BHC	ND	ug/L	0.0050	0.00064	EPA-508	ND		1
delta-BHC	ND	ug/L	0.0050	0.0015	EPA-508	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.00067	EPA-508	ND		1
Chlordane (Technical)	ND	ug/L	0.10	0.045	EPA-508	ND		1
4,4'-DDD	ND	ug/L	0.0050	0.00086	EPA-508	ND		1
4,4'-DDE	ND	ug/L	0.0050	0.0013	EPA-508	ND		1
4,4'-DDT	ND	ug/L	0.0050	0.00096	EPA-508	ND		1
Dieldrin	ND	ug/L	0.0050	0.0011	EPA-508	ND		1
Endosulfan I	ND	ug/L	0.0050	0.00068	EPA-508	ND		1
Endosulfan II	ND	ug/L	0.0050	0.00098	EPA-508	ND		1
Endosulfan sulfate	ND	ug/L	0.0050	0.00055	EPA-508	ND		1
Endrin	ND	ug/L	0.0050	0.00069	EPA-508	ND		1
Endrin aldehyde	ND	ug/L	0.010	0.00054	EPA-508	ND		1
Heptachlor	ND	ug/L	0.0050	0.00094	EPA-508	ND		1
Heptachlor epoxide	ND	ug/L	0.0050	0.00064	EPA-508	ND		1
Methoxychlor	ND	ug/L	0.0050	0.0037	EPA-508	ND		1
Toxaphene	ND	ug/L	1.0	0.20	EPA-508	ND		1
PCB-1016	ND	ug/L	0.20	0.066	EPA-508	ND		1
PCB-1221	ND	ug/L	0.20	0.063	EPA-508	ND		1
PCB-1232	ND	ug/L	0.20	0.059	EPA-508	ND		1
PCB-1242	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1248	ND	ug/L	0.20	0.044	EPA-508	ND		1
PCB-1254	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1260	ND	ug/L	0.20	0.089	EPA-508	ND		1
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-508	ND		1
TCMX (Surrogate)	80.8	%	60 - 130 (LCL - UCL)		EPA-508			1
Decachlorobiphenyl (Surrogate)	90.9	%	60 - 130 (LCL - UCL)		EPA-508			1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-508	10/07/20 20:30	10/08/20 23:54		HKS	GC-17	1.099	B089404	EPA 508

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis (EPA Method 515.1)

BCL Sample ID:	2028653-01	Client Sample Name:	Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bentazon	ND	ug/L	0.80	0.22	EPA-515.1	ND		1
2,4-D	ND	ug/L	0.40	0.18	EPA-515.1	ND		1
2,4-DB	ND	ug/L	3.0	0.37	EPA-515.1	ND		1
Dalapon	ND	ug/L	5.0	0.31	EPA-515.1	ND		1
Dicamba	ND	ug/L	0.080	0.040	EPA-515.1	ND		1
Dichloroprop	ND	ug/L	0.50	0.11	EPA-515.1	ND		1
Dinoseb	ND	ug/L	0.20	0.057	EPA-515.1	ND		1
MCPA	ND	ug/L	10	6.0	EPA-515.1	ND		1
MCPP	ND	ug/L	10	6.0	EPA-515.1	ND		1
2,4,5-T	ND	ug/L	0.090	0.012	EPA-515.1	ND		1
2,4,5-TP (Silvex)	ND	ug/L	0.070	0.032	EPA-515.1	ND		1
2,4-Dichlorophenylacetic acid (Surrogate)	88.2	%	40 - 120 (LCL - UCL)		EPA-515.1			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-515.1	10/07/20 21:00	10/08/20 16:16	OLH	GC-8	1	B089375	EPA 515.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-01		Client Sample Name: Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-01		Client Sample Name: Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2028653-01	Client Sample Name:	Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	93.9	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	97.4	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	99.1	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	10/05/20 07:00	10/05/20 13:21	MGC	MS-V5	1	B088874	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2028653-01		Client Sample Name: Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthylene	ND	ug/L	0.10	0.031	EPA-525.2	ND		1
Alachlor	ND	ug/L	0.20	0.090	EPA-525.2	ND		1
Anthracene	ND	ug/L	0.10	0.034	EPA-525.2	ND		1
Atraton	ND	ug/L	0.50	0.057	EPA-525.2	ND		1
Atrazine	ND	ug/L	0.30	0.14	EPA-525.2	ND		1
Benzo[a]anthracene	ND	ug/L	0.20	0.044	EPA-525.2	ND		1
Benzo[b]fluoranthene	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Benzo[k]fluoranthene	ND	ug/L	0.30	0.072	EPA-525.2	ND		1
Benzo[a]pyrene	ND	ug/L	0.10	0.050	EPA-525.2	ND		1
Benzo[g,h,i]perylene	ND	ug/L	0.30	0.065	EPA-525.2	ND		1
Benzyl butyl phthalate	ND	ug/L	4.0	0.047	EPA-525.2	ND		1
delta-BHC	ND	ug/L	0.20	0.048	EPA-525.2	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.20	0.063	EPA-525.2	ND		1
bis(2-Ethylhexyl)phthalate	ND	ug/L	3.0	0.030	EPA-525.2	ND		1
Bromacil	ND	ug/L	0.50	0.043	EPA-525.2	ND		1
Chrysene	ND	ug/L	0.30	0.060	EPA-525.2	ND		1
Diazinon	ND	ug/L	0.20	0.080	EPA-525.2	ND		1
Dibenzo[a,h]anthracene	ND	ug/L	0.30	0.051	EPA-525.2	ND		1
Di(2-ethylhexyl)adipate	ND	ug/L	1.0	0.025	EPA-525.2	ND		1
Dimethoate	ND	ug/L	2.0	0.050	EPA-525.2	ND		1
Dimethyl phthalate	ND	ug/L	1.0	0.034	EPA-525.2	ND		1
Di-n-butyl phthalate	ND	ug/L	1.0	0.063	EPA-525.2	ND		1
Fluorene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorobenzene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorocyclopentadiene	ND	ug/L	1.0	0.12	EPA-525.2	ND		1
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.30	0.032	EPA-525.2	ND		1
Methoxychlor	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Metolachlor	ND	ug/L	0.50	0.056	EPA-525.2	ND		1
Metribuzin	ND	ug/L	0.50	0.048	EPA-525.2	ND		1
Molinate	ND	ug/L	0.50	0.036	EPA-525.2	ND		1
Phenanthrene	ND	ug/L	0.10	0.020	EPA-525.2	ND		1
Prometon	ND	ug/L	0.50	0.11	EPA-525.2	ND		1
Prometryn	ND	ug/L	0.50	0.045	EPA-525.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2028653-01		Client Sample Name: Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Pyrene	ND	ug/L	0.10	0.040	EPA-525.2	ND		1
Secbumeton	ND	ug/L	0.50	0.079	EPA-525.2	ND		1
Simazine	ND	ug/L	0.30	0.066	EPA-525.2	ND		1
Terbutryn	ND	ug/L	0.50	0.050	EPA-525.2	ND		1
Thiobencarb	ND	ug/L	0.50	0.044	EPA-525.2	ND		1
Perylene-d12 (Surrogate)	101	%	60 - 140 (LCL - UCL)		EPA-525.2			1
1,3-Dimethyl-2-nitrobenzene (Surrogate)	102	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Triphenylphosphate (Surrogate)	98.8	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Pyrene-d10 (Surrogate)	86.2	%	70 - 130 (LCL - UCL)		EPA-525.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-525.2	10/06/20 08:00	10/07/20 20:00	MK1	MS-B6	1	B089066	EPA 525.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

EPA Method 1664

BCL Sample ID:	2028653-01	Client Sample Name:	Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/L	5.0	0.74	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-1664A HEM	10/07/20 09:00	10/07/20 13:44		MAM	Inst	1	B089179	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Water Analysis (General Chemistry)

BCL Sample ID:	2028653-01	Client Sample Name:	Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Chloride	390	mg/L	1.0	0.26	EPA-300.0	0.43	A07	1
Nitrate as N	2.0	mg/L	0.20	0.048	EPA-300.0	ND	A07	1
Sulfate	410	mg/L	2.0	0.28	EPA-300.0	ND	A07	1
Total Dissolved Solids @ 180 C	1500	mg/L	100	50	EPA-160.1	ND	A07	2
Total Suspended Solids (Glass Fiber)	6.0	mg/L	0.56	0.56	EPA-160.2	ND	A07	3
MBAS	ND	mg/L	0.20	0.048	EPA-425.1	ND	A07	4
Total Nitrogen	2.6	mg/L	0.30	0.10	Calc	ND		5
Total Kjeldahl Nitrogen	0.57	mg/L	0.20	0.088	EPA-351.2	ND		6
Nitrite as N	ND	ug/L	50	10	EPA-353.2	ND		7
Total Phosphorus	0.12	mg/L	0.050	0.018	EPA-365.4	ND		8
Non-Volatile Organic Carbon	4.2	mg/L	1.0	0.30	EPA-415.1	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-300.0	10/01/20 22:00	10/02/20 02:58	SAV	IC7	2	B088791	No Prep
2	EPA-160.1	10/05/20 15:30	10/05/20 15:30	CAD	MANUAL	10	B088971	No Prep
3	EPA-160.2	10/05/20 09:20	10/05/20 09:20	OJP	MANUAL	1.111	B088940	No Prep
4	EPA-425.1	10/02/20 11:15	10/02/20 11:15	JMN	MANUAL	2	B088830	No Prep
5	Calc	10/02/20 10:01	10/20/20 16:01	AMM	Calc	1	B^J0012	Calc
6	EPA-351.2	10/19/20 10:30	10/20/20 09:37	JMH2	SC-2	1	B090236	EPA 351.2
7	EPA-353.2	10/02/20 10:01	10/02/20 10:05	MC1	KONE-1	1	B088957	No Prep
8	EPA-365.4	10/19/20 10:30	10/20/20 09:19	JMH2	SC-1	1	B090237	EPA 365.4
9	EPA-415.1	10/05/20 07:00	10/05/20 07:47	ALW	TOC2	1	B088760	No Prep

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

BCL Sample ID:	2028653-01	Client Sample Name:	Ivanhoe #11, 10/1/2020 10:50:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Antimony	0.16	ug/L	2.0	0.11	EPA-200.8	ND	J	1
Total Recoverable Arsenic	2.0	ug/L	2.0	0.70	EPA-200.8	ND		1
Total Recoverable Barium	180	ug/L	1.0	0.21	EPA-200.8	0.27		1
Total Recoverable Beryllium	ND	ug/L	1.0	0.14	EPA-200.8	ND		1
Total Recoverable Cadmium	0.32	ug/L	1.0	0.11	EPA-200.8	0.16	J	1
Total Recoverable Chromium	1.9	ug/L	3.0	0.50	EPA-200.8	0.64	J	1
Total Recoverable Cobalt	5.3	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Copper	62	ug/L	2.0	0.22	EPA-200.8	0.69		1
Total Recoverable Iron	2900	ug/L	50	30	EPA-200.7	ND		2
Total Recoverable Lead	6.4	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Manganese	1700	ug/L	10	4.0	EPA-200.7	ND		2
Total Recoverable Mercury	0.40	ug/L	0.20	0.022	EPA-245.1	ND		3
Total Recoverable Molybdenum	17	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Nickel	5.8	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Selenium	11	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Silver	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Thallium	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Vanadium	120	ug/L	3.0	0.78	EPA-200.8	ND		1
Total Recoverable Zinc	120	ug/L	10	1.7	EPA-200.8	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-200.8	10/08/20 10:30	10/09/20 09:45	JNC	PE-EL2	1	B089329	EPA 200.2
2	EPA-200.7	10/09/20 07:45	10/09/20 17:48	JRG	PE-OP4	1	B089436	EPA 200.2
3	EPA-245.1	10/07/20 08:00	10/07/20 16:21	TMT	CETAC3	1	B089142	EPA 245.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organochlorine Pesticides and PCB's (EPA Method 508)

BCL Sample ID: 2028653-02		Client Sample Name: Lake #11, 10/1/2020 10:40:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ug/L	0.0050	0.00095	EPA-508	ND		1
alpha-BHC	ND	ug/L	0.0050	0.00050	EPA-508	ND		1
beta-BHC	ND	ug/L	0.0050	0.00064	EPA-508	ND		1
delta-BHC	ND	ug/L	0.0050	0.0015	EPA-508	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.00067	EPA-508	ND		1
Chlordane (Technical)	ND	ug/L	0.10	0.045	EPA-508	ND		1
4,4'-DDD	ND	ug/L	0.0050	0.00086	EPA-508	ND		1
4,4'-DDE	ND	ug/L	0.0050	0.0013	EPA-508	ND		1
4,4'-DDT	ND	ug/L	0.0050	0.00096	EPA-508	ND		1
Dieldrin	ND	ug/L	0.0050	0.0011	EPA-508	ND		1
Endosulfan I	ND	ug/L	0.0050	0.00068	EPA-508	ND		1
Endosulfan II	ND	ug/L	0.0050	0.00098	EPA-508	ND		1
Endosulfan sulfate	ND	ug/L	0.0050	0.00055	EPA-508	ND		1
Endrin	ND	ug/L	0.0050	0.00069	EPA-508	ND		1
Endrin aldehyde	ND	ug/L	0.010	0.00054	EPA-508	ND		1
Heptachlor	ND	ug/L	0.0050	0.00094	EPA-508	ND		1
Heptachlor epoxide	ND	ug/L	0.0050	0.00064	EPA-508	ND		1
Methoxychlor	ND	ug/L	0.0050	0.0037	EPA-508	ND		1
Toxaphene	ND	ug/L	1.0	0.20	EPA-508	ND		1
PCB-1016	ND	ug/L	0.20	0.066	EPA-508	ND		1
PCB-1221	ND	ug/L	0.20	0.063	EPA-508	ND		1
PCB-1232	ND	ug/L	0.20	0.059	EPA-508	ND		1
PCB-1242	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1248	ND	ug/L	0.20	0.044	EPA-508	ND		1
PCB-1254	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1260	ND	ug/L	0.20	0.089	EPA-508	ND		1
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-508	ND		1
TCMX (Surrogate)	90.6	%	60 - 130 (LCL - UCL)		EPA-508			1
Decachlorobiphenyl (Surrogate)	137	%	60 - 130 (LCL - UCL)		EPA-508		A19	1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-508	10/07/20 20:30	10/09/20 00:10		HKS	GC-17	1.075	B089404	EPA 508

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis (EPA Method 515.1)

BCL Sample ID: 2028653-02		Client Sample Name: Lake #11, 10/1/2020 10:40:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bentazon	ND	ug/L	0.80	0.22	EPA-515.1	ND		1
2,4-D	ND	ug/L	0.40	0.18	EPA-515.1	ND		1
2,4-DB	ND	ug/L	3.0	0.37	EPA-515.1	ND		1
Dalapon	ND	ug/L	5.0	0.31	EPA-515.1	ND		1
Dicamba	ND	ug/L	0.080	0.040	EPA-515.1	ND		1
Dichloroprop	ND	ug/L	0.50	0.11	EPA-515.1	ND		1
Dinoseb	ND	ug/L	0.20	0.057	EPA-515.1	ND		1
MCPA	ND	ug/L	10	6.0	EPA-515.1	ND		1
MCPP	ND	ug/L	10	6.0	EPA-515.1	ND		1
2,4,5-T	ND	ug/L	0.090	0.012	EPA-515.1	ND		1
2,4,5-TP (Silvex)	ND	ug/L	0.070	0.032	EPA-515.1	ND		1
2,4-Dichlorophenylacetic acid (Surrogate)	69.3	%	40 - 120 (LCL - UCL)		EPA-515.1			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-515.1	10/07/20 21:00	10/08/20 16:37	OLH	GC-8	1.031	B089375	EPA 515.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-02		Client Sample Name: Lake #11, 10/1/2020 10:40:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-02		Client Sample Name: Lake #11, 10/1/2020 10:40:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2028653-02	Client Sample Name:	Lake #11, 10/1/2020 10:40:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	98.7	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	97.1	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	97.4	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	10/05/20 07:00	10/05/20 13:45	MGC	MS-V5	1	B088874	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2028653-02		Client Sample Name: Lake #11, 10/1/2020 10:40:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthylene	ND	ug/L	0.10	0.031	EPA-525.2	ND		1
Alachlor	ND	ug/L	0.20	0.090	EPA-525.2	ND		1
Anthracene	ND	ug/L	0.10	0.034	EPA-525.2	ND		1
Atraton	ND	ug/L	0.50	0.057	EPA-525.2	ND		1
Atrazine	ND	ug/L	0.30	0.14	EPA-525.2	ND		1
Benzo[a]anthracene	ND	ug/L	0.20	0.044	EPA-525.2	ND		1
Benzo[b]fluoranthene	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Benzo[k]fluoranthene	ND	ug/L	0.30	0.072	EPA-525.2	ND		1
Benzo[a]pyrene	ND	ug/L	0.10	0.050	EPA-525.2	ND		1
Benzo[g,h,i]perylene	ND	ug/L	0.30	0.065	EPA-525.2	ND		1
Benzyl butyl phthalate	ND	ug/L	4.0	0.047	EPA-525.2	ND		1
delta-BHC	ND	ug/L	0.20	0.048	EPA-525.2	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.20	0.063	EPA-525.2	ND		1
bis(2-Ethylhexyl)phthalate	ND	ug/L	3.0	0.030	EPA-525.2	ND		1
Bromacil	ND	ug/L	0.50	0.043	EPA-525.2	ND		1
Chrysene	ND	ug/L	0.30	0.060	EPA-525.2	ND		1
Diazinon	ND	ug/L	0.20	0.080	EPA-525.2	ND		1
Dibenzo[a,h]anthracene	ND	ug/L	0.30	0.051	EPA-525.2	ND		1
Di(2-ethylhexyl)adipate	ND	ug/L	1.0	0.025	EPA-525.2	ND		1
Dimethoate	ND	ug/L	2.0	0.050	EPA-525.2	ND		1
Dimethyl phthalate	ND	ug/L	1.0	0.034	EPA-525.2	ND		1
Di-n-butyl phthalate	ND	ug/L	1.0	0.063	EPA-525.2	ND		1
Fluorene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorobenzene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorocyclopentadiene	ND	ug/L	1.0	0.12	EPA-525.2	ND		1
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.30	0.032	EPA-525.2	ND		1
Methoxychlor	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Metolachlor	ND	ug/L	0.50	0.056	EPA-525.2	ND		1
Metribuzin	ND	ug/L	0.50	0.048	EPA-525.2	ND		1
Molinate	ND	ug/L	0.50	0.036	EPA-525.2	ND		1
Phenanthrene	ND	ug/L	0.10	0.020	EPA-525.2	ND		1
Prometon	ND	ug/L	0.50	0.11	EPA-525.2	ND		1
Prometryn	ND	ug/L	0.50	0.045	EPA-525.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID:	2028653-02	Client Sample Name:	Lake #11, 10/1/2020 10:40:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Pyrene	ND	ug/L	0.10	0.040	EPA-525.2	ND		1
Secbumeton	ND	ug/L	0.50	0.079	EPA-525.2	ND		1
Simazine	ND	ug/L	0.30	0.066	EPA-525.2	ND		1
Terbutryn	ND	ug/L	0.50	0.050	EPA-525.2	ND		1
Thiobencarb	ND	ug/L	0.50	0.044	EPA-525.2	ND		1
Perylene-d12 (Surrogate)	105	%	60 - 140 (LCL - UCL)		EPA-525.2			1
1,3-Dimethyl-2-nitrobenzene (Surrogate)	123	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Triphenylphosphate (Surrogate)	115	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Pyrene-d10 (Surrogate)	89.2	%	70 - 130 (LCL - UCL)		EPA-525.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-525.2	10/06/20 08:00	10/07/20 20:27	MK1	MS-B6	1	B089066	EPA 525.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

EPA Method 1664

BCL Sample ID:	2028653-02	Client Sample Name:	Lake #11, 10/1/2020 10:40:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/L	5.0	0.74	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-1664A HEM	10/07/20 09:00	10/07/20 13:44		MAM	Inst	1	B089179	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Water Analysis (General Chemistry)

BCL Sample ID:	2028653-02	Client Sample Name:	Lake #11, 10/1/2020 10:40:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Chloride	630	mg/L	2.5	0.65	EPA-300.0	1.1	A07	1
Nitrate as N	0.61	mg/L	0.20	0.048	EPA-300.0	ND	A07	2
Sulfate	310	mg/L	2.0	0.28	EPA-300.0	ND	A07	2
Total Dissolved Solids @ 180 C	1900	mg/L	100	50	EPA-160.1	ND	A07	3
Total Suspended Solids (Glass Fiber)	7.6	mg/L	0.66	0.66	EPA-160.2	ND	A07	4
MBAS	0.024	mg/L	0.10	0.024	EPA-425.1	ND	J	5
Total Nitrogen	24	mg/L	0.30	0.10	Calc	ND		6
Total Kjeldahl Nitrogen	23	mg/L	1.0	0.44	EPA-351.2	ND	A07	7
Nitrite as N	100	ug/L	50	10	EPA-353.2	ND		8
Total Phosphorus	ND	mg/L	0.25	0.090	EPA-365.4	ND	A07	9
Non-Volatile Organic Carbon	8.4	mg/L	2.0	0.60	EPA-415.1	ND	A07	10

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-300.0	10/01/20 22:00	10/02/20 08:56	SAV	IC7	5	B088791	No Prep
2	EPA-300.0	10/01/20 22:00	10/02/20 03:16	SAV	IC7	2	B088791	No Prep
3	EPA-160.1	10/05/20 15:30	10/05/20 15:30	CAD	MANUAL	10	B088971	No Prep
4	EPA-160.2	10/05/20 09:20	10/05/20 09:20	OJP	MANUAL	1.316	B088940	No Prep
5	EPA-425.1	10/02/20 11:15	10/02/20 11:15	JMN	MANUAL	1	B088830	No Prep
6	Calc	10/02/20 10:01	10/20/20 16:01	AMM	Calc	1	B^J0012	Calc
7	EPA-351.2	10/19/20 10:30	10/20/20 09:41	JMH2	SC-2	5	B090236	EPA 351.2
8	EPA-353.2	10/02/20 10:01	10/02/20 10:05	MC1	KONE-1	1	B088957	No Prep
9	EPA-365.4	10/19/20 10:30	10/20/20 09:21	JMH2	SC-1	5	B090237	EPA 365.4
10	EPA-415.1	10/02/20 10:00	10/02/20 17:12	ALW	TOC2	2	B088760	No Prep

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

BCL Sample ID:	2028653-02	Client Sample Name:	Lake #11, 10/1/2020 10:40:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Antimony	0.13	ug/L	2.0	0.11	EPA-200.8	ND	J	1
Total Recoverable Arsenic	2.4	ug/L	2.0	0.70	EPA-200.8	ND		1
Total Recoverable Barium	120	ug/L	1.0	0.21	EPA-200.8	0.27		1
Total Recoverable Beryllium	ND	ug/L	1.0	0.14	EPA-200.8	ND		1
Total Recoverable Cadmium	0.19	ug/L	1.0	0.11	EPA-200.8	0.16	J	1
Total Recoverable Chromium	ND	ug/L	3.0	0.50	EPA-200.8	0.64		1
Total Recoverable Cobalt	11	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Copper	2.8	ug/L	2.0	0.22	EPA-200.8	0.69		1
Total Recoverable Iron	1100	ug/L	50	30	EPA-200.7	ND		2
Total Recoverable Lead	0.16	ug/L	1.0	0.10	EPA-200.8	ND	J	1
Total Recoverable Manganese	1200	ug/L	10	4.0	EPA-200.7	ND		2
Total Recoverable Mercury	0.20	ug/L	0.20	0.022	EPA-245.1	ND		3
Total Recoverable Molybdenum	310	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Nickel	4.8	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Selenium	2.2	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Silver	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Thallium	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Vanadium	3.6	ug/L	3.0	0.78	EPA-200.8	ND		1
Total Recoverable Zinc	19	ug/L	10	1.7	EPA-200.8	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-200.8	10/08/20 10:30	10/09/20 09:47	JNC	PE-EL2	1	B089329	EPA 200.2
2	EPA-200.7	10/09/20 07:45	10/09/20 17:50	JRG	PE-OP4	1	B089436	EPA 200.2
3	EPA-245.1	10/07/20 08:00	10/07/20 16:23	TMT	CETAC3	1	B089142	EPA 245.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organochlorine Pesticides and PCB's (EPA Method 508)

BCL Sample ID: 2028653-03		Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ug/L	0.0050	0.00095	EPA-508	ND		1
alpha-BHC	ND	ug/L	0.0050	0.00050	EPA-508	ND		1
beta-BHC	ND	ug/L	0.0050	0.00064	EPA-508	ND		1
delta-BHC	ND	ug/L	0.0050	0.0015	EPA-508	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.00067	EPA-508	ND		1
Chlordane (Technical)	ND	ug/L	0.10	0.045	EPA-508	ND		1
4,4'-DDD	ND	ug/L	0.0050	0.00086	EPA-508	ND		1
4,4'-DDE	ND	ug/L	0.0050	0.0013	EPA-508	ND		1
4,4'-DDT	ND	ug/L	0.0050	0.00096	EPA-508	ND		1
Dieldrin	ND	ug/L	0.0050	0.0011	EPA-508	ND		1
Endosulfan I	ND	ug/L	0.0050	0.00068	EPA-508	ND		1
Endosulfan II	ND	ug/L	0.0050	0.00098	EPA-508	ND		1
Endosulfan sulfate	ND	ug/L	0.0050	0.00055	EPA-508	ND		1
Endrin	ND	ug/L	0.0050	0.00069	EPA-508	ND		1
Endrin aldehyde	ND	ug/L	0.010	0.00054	EPA-508	ND		1
Heptachlor	ND	ug/L	0.0050	0.00094	EPA-508	ND		1
Heptachlor epoxide	ND	ug/L	0.0050	0.00064	EPA-508	ND		1
Methoxychlor	ND	ug/L	0.0050	0.0037	EPA-508	ND		1
Toxaphene	ND	ug/L	1.0	0.20	EPA-508	ND		1
PCB-1016	ND	ug/L	0.20	0.066	EPA-508	ND		1
PCB-1221	ND	ug/L	0.20	0.063	EPA-508	ND		1
PCB-1232	ND	ug/L	0.20	0.059	EPA-508	ND		1
PCB-1242	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1248	ND	ug/L	0.20	0.044	EPA-508	ND		1
PCB-1254	ND	ug/L	0.20	0.037	EPA-508	ND		1
PCB-1260	ND	ug/L	0.20	0.089	EPA-508	ND		1
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-508	ND		1
TCMX (Surrogate)	78.5	%	60 - 130 (LCL - UCL)		EPA-508			1
Decachlorobiphenyl (Surrogate)	88.7	%	60 - 130 (LCL - UCL)		EPA-508			1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	Prep Method
1	EPA-508	10/07/20 20:30	10/09/20 00:27		HKS	GC-17	1.087	B089404	EPA 508

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis (EPA Method 515.1)

BCL Sample ID:	2028653-03	Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Bentazon	ND	ug/L	0.80	0.22	EPA-515.1	ND		1
2,4-D	ND	ug/L	0.40	0.18	EPA-515.1	ND		1
2,4-DB	ND	ug/L	3.0	0.37	EPA-515.1	ND		1
Dalapon	ND	ug/L	5.0	0.31	EPA-515.1	ND		1
Dicamba	ND	ug/L	0.080	0.040	EPA-515.1	ND		1
Dichloroprop	ND	ug/L	0.50	0.11	EPA-515.1	ND		1
Dinoseb	ND	ug/L	0.20	0.057	EPA-515.1	ND		1
MCPA	ND	ug/L	10	6.0	EPA-515.1	ND		1
MCPP	ND	ug/L	10	6.0	EPA-515.1	ND		1
2,4,5-T	ND	ug/L	0.090	0.012	EPA-515.1	ND		1
2,4,5-TP (Silvex)	ND	ug/L	0.070	0.032	EPA-515.1	ND		1
2,4-Dichlorophenylacetic acid (Surrogate)	99.5	%	40 - 120 (LCL - UCL)		EPA-515.1			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-515.1	10/07/20 21:00	10/08/20 16:58	OLH	GC-8	1.053	B089375	EPA 515.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-03		Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-03		Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2028653-03	Client Sample Name:	Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	94.0	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	97.0	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	96.5	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	10/05/20 07:00	10/05/20 14:09	MGC	MS-V5	1	B088874	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2028653-03		Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthylene	ND	ug/L	0.10	0.031	EPA-525.2	ND		1
Alachlor	ND	ug/L	0.20	0.090	EPA-525.2	ND		1
Anthracene	ND	ug/L	0.10	0.034	EPA-525.2	ND		1
Atraton	ND	ug/L	0.50	0.057	EPA-525.2	ND		1
Atrazine	ND	ug/L	0.30	0.14	EPA-525.2	ND		1
Benzo[a]anthracene	ND	ug/L	0.20	0.044	EPA-525.2	ND		1
Benzo[b]fluoranthene	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Benzo[k]fluoranthene	ND	ug/L	0.30	0.072	EPA-525.2	ND		1
Benzo[a]pyrene	ND	ug/L	0.10	0.050	EPA-525.2	ND		1
Benzo[g,h,i]perylene	ND	ug/L	0.30	0.065	EPA-525.2	ND		1
Benzyl butyl phthalate	ND	ug/L	4.0	0.047	EPA-525.2	ND		1
delta-BHC	ND	ug/L	0.20	0.048	EPA-525.2	ND		1
gamma-BHC (Lindane)	ND	ug/L	0.20	0.063	EPA-525.2	ND		1
bis(2-Ethylhexyl)phthalate	ND	ug/L	3.0	0.030	EPA-525.2	ND		1
Bromacil	ND	ug/L	0.50	0.043	EPA-525.2	ND		1
Chrysene	ND	ug/L	0.30	0.060	EPA-525.2	ND		1
Diazinon	ND	ug/L	0.20	0.080	EPA-525.2	ND		1
Dibenzo[a,h]anthracene	ND	ug/L	0.30	0.051	EPA-525.2	ND		1
Di(2-ethylhexyl)adipate	ND	ug/L	1.0	0.025	EPA-525.2	ND		1
Dimethoate	ND	ug/L	2.0	0.050	EPA-525.2	ND		1
Dimethyl phthalate	ND	ug/L	1.0	0.034	EPA-525.2	ND		1
Di-n-butyl phthalate	ND	ug/L	1.0	0.063	EPA-525.2	ND		1
Fluorene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorobenzene	ND	ug/L	0.20	0.029	EPA-525.2	ND		1
Hexachlorocyclopentadiene	ND	ug/L	1.0	0.12	EPA-525.2	ND		1
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.30	0.032	EPA-525.2	ND		1
Methoxychlor	ND	ug/L	0.30	0.034	EPA-525.2	ND		1
Metolachlor	ND	ug/L	0.50	0.056	EPA-525.2	ND		1
Metribuzin	ND	ug/L	0.50	0.048	EPA-525.2	ND		1
Molinate	ND	ug/L	0.50	0.036	EPA-525.2	ND		1
Phenanthrene	ND	ug/L	0.10	0.020	EPA-525.2	ND		1
Prometon	ND	ug/L	0.50	0.11	EPA-525.2	ND		1
Prometryn	ND	ug/L	0.50	0.045	EPA-525.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

BCL Sample ID: 2028653-03		Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Pyrene	ND	ug/L	0.10	0.040	EPA-525.2	ND		1
Secbumeton	ND	ug/L	0.50	0.079	EPA-525.2	ND		1
Simazine	ND	ug/L	0.30	0.066	EPA-525.2	ND		1
Terbutryn	ND	ug/L	0.50	0.050	EPA-525.2	ND		1
Thiobencarb	ND	ug/L	0.50	0.044	EPA-525.2	ND		1
Perylene-d12 (Surrogate)	98.4	%	60 - 140 (LCL - UCL)		EPA-525.2			1
1,3-Dimethyl-2-nitrobenzene (Surrogate)	103	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Triphenylphosphate (Surrogate)	110	%	70 - 130 (LCL - UCL)		EPA-525.2			1
Pyrene-d10 (Surrogate)	91.8	%	70 - 130 (LCL - UCL)		EPA-525.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-525.2	10/06/20 08:00	10/07/20 20:53	MK1	MS-B6	1	B089066	EPA 525.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

EPA Method 1664

BCL Sample ID:	2028653-03	Client Sample Name:	Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	ND	mg/L	5.0	0.74	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-1664A HEM	10/07/20 09:00	10/07/20 13:44	MAM	Inst	1.087	B089179	EPA 1664/HEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Water Analysis (General Chemistry)

BCL Sample ID:	2028653-03	Client Sample Name:	Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Qualls	Run #
Chloride	380	mg/L	1.0	0.26	EPA-300.0	0.43	A07	1
Nitrate as N	2.6	mg/L	0.20	0.048	EPA-300.0	ND	A07	1
Sulfate	400	mg/L	2.0	0.28	EPA-300.0	ND	A07	1
Total Dissolved Solids @ 180 C	1600	mg/L	100	50	EPA-160.1	ND	A07	2
Total Suspended Solids (Glass Fiber)	ND	mg/L	0.56	0.56	EPA-160.2	ND	A07	3
MBAS	ND	mg/L	0.10	0.024	EPA-425.1	ND		4
Total Nitrogen	3.1	mg/L	0.30	0.10	Calc	ND		5
Total Kjeldahl Nitrogen	0.39	mg/L	0.20	0.088	EPA-351.2	ND		6
Nitrite as N	64	ug/L	50	10	EPA-353.2	ND		7
Total Phosphorus	ND	mg/L	0.050	0.018	EPA-365.4	ND		8
Non-Volatile Organic Carbon	3.9	mg/L	1.0	0.30	EPA-415.1	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-300.0	10/01/20 22:00	10/02/20 03:34	SAV	IC7	2	B088791	No Prep
2	EPA-160.1	10/05/20 15:30	10/05/20 15:30	CAD	MANUAL	10	B088971	No Prep
3	EPA-160.2	10/05/20 09:20	10/05/20 09:20	OJP	MANUAL	1.111	B088940	No Prep
4	EPA-425.1	10/02/20 11:15	10/02/20 11:15	JMN	MANUAL	1	B088830	No Prep
5	Calc	10/02/20 10:01	10/20/20 16:01	AMM	Calc	1	B^J0012	Calc
6	EPA-351.2	10/19/20 10:30	10/20/20 09:42	JMH2	SC-2	1	B090236	EPA 351.2
7	EPA-353.2	10/02/20 10:01	10/02/20 10:05	MC1	KONE-1	1	B088957	No Prep
8	EPA-365.4	10/19/20 10:30	10/20/20 09:22	JMH2	SC-1	1	B090237	EPA 365.4
9	EPA-415.1	10/05/20 07:00	10/05/20 08:02	ALW	TOC2	1	B088760	No Prep

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

BCL Sample ID: 2028653-03		Client Sample Name: Ivanhoe #8, 10/1/2020 10:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Antimony	ND	ug/L	2.0	0.11	EPA-200.8	ND		1
Total Recoverable Arsenic	ND	ug/L	2.0	0.70	EPA-200.8	ND		1
Total Recoverable Barium	140	ug/L	1.0	0.21	EPA-200.8	0.27		1
Total Recoverable Beryllium	ND	ug/L	1.0	0.14	EPA-200.8	ND		1
Total Recoverable Cadmium	0.15	ug/L	1.0	0.11	EPA-200.8	0.16	J	1
Total Recoverable Chromium	ND	ug/L	3.0	0.50	EPA-200.8	0.64		1
Total Recoverable Cobalt	2.5	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Copper	3.7	ug/L	2.0	0.22	EPA-200.8	0.69		1
Total Recoverable Iron	ND	ug/L	50	30	EPA-200.7	ND		2
Total Recoverable Lead	0.17	ug/L	1.0	0.10	EPA-200.8	ND	J	1
Total Recoverable Manganese	140	ug/L	10	4.0	EPA-200.7	ND		2
Total Recoverable Mercury	0.13	ug/L	0.20	0.022	EPA-245.1	ND	J	3
Total Recoverable Molybdenum	9.5	ug/L	1.0	0.11	EPA-200.8	ND		1
Total Recoverable Nickel	4.1	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Selenium	14	ug/L	2.0	0.19	EPA-200.8	ND		1
Total Recoverable Silver	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Thallium	ND	ug/L	1.0	0.10	EPA-200.8	ND		1
Total Recoverable Vanadium	41	ug/L	3.0	0.78	EPA-200.8	ND		1
Total Recoverable Zinc	3.9	ug/L	10	1.7	EPA-200.8	ND	J	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-200.8	10/08/20 10:30	10/09/20 09:48	JNC	PE-EL2	1	B089329	EPA 200.2
2	EPA-200.7	10/12/20 09:30	10/12/20 15:06	JRG	PE-OP4	1	B089534	EPA 200.2
3	EPA-245.1	10/07/20 08:00	10/07/20 16:25	TMT	CETAC3	1	B089142	EPA 245.1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-04		Client Sample Name: QCAB, 10/1/2020 12:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-04		Client Sample Name: QCAB, 10/1/2020 12:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2028653-04	Client Sample Name:	QCAB, 10/1/2020 12:00:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	96.3	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	98.2	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	95.7	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	10/05/20 07:00	10/05/20 14:33	MGC	MS-V5	1	B088874	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-05		Client Sample Name: QCTB, 10/1/2020 12:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 2028653-05		Client Sample Name: QCTB, 10/1/2020 12:00:00AM, Nick Reason						
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID:	2028653-05	Client Sample Name:	QCTB, 10/1/2020 12:00:00AM, Nick Reason					
Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	95.8	%	75 - 125 (LCL - UCL)		EPA-524.2			1
Toluene-d8 (Surrogate)	98.8	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	98.0	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID	Prep Method
1	EPA-524.2	10/05/20 07:00	10/05/20 14:57	MGC	MS-V5	1	B088874	EPA 524.2

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B089404						
Aldrin	B089404-BLK1	ND	ug/L	0.0050	0.00095	
alpha-BHC	B089404-BLK1	ND	ug/L	0.0050	0.00050	
beta-BHC	B089404-BLK1	ND	ug/L	0.0050	0.00064	
delta-BHC	B089404-BLK1	ND	ug/L	0.0050	0.0015	
gamma-BHC (Lindane)	B089404-BLK1	ND	ug/L	0.0050	0.00067	
Chlordane (Technical)	B089404-BLK1	ND	ug/L	0.10	0.045	
4,4'-DDD	B089404-BLK1	ND	ug/L	0.0050	0.00086	
4,4'-DDE	B089404-BLK1	ND	ug/L	0.0050	0.0013	
4,4'-DDT	B089404-BLK1	ND	ug/L	0.0050	0.00096	
Dieldrin	B089404-BLK1	ND	ug/L	0.0050	0.0011	
Endosulfan I	B089404-BLK1	ND	ug/L	0.0050	0.00068	
Endosulfan II	B089404-BLK1	ND	ug/L	0.0050	0.00098	
Endosulfan sulfate	B089404-BLK1	ND	ug/L	0.0050	0.00055	
Endrin	B089404-BLK1	ND	ug/L	0.0050	0.00069	
Endrin aldehyde	B089404-BLK1	ND	ug/L	0.010	0.00054	
Heptachlor	B089404-BLK1	ND	ug/L	0.0050	0.00094	
Heptachlor epoxide	B089404-BLK1	ND	ug/L	0.0050	0.00064	
Methoxychlor	B089404-BLK1	ND	ug/L	0.0050	0.0037	
Toxaphene	B089404-BLK1	ND	ug/L	1.0	0.20	
PCB-1016	B089404-BLK1	ND	ug/L	0.20	0.066	
PCB-1221	B089404-BLK1	ND	ug/L	0.20	0.063	
PCB-1232	B089404-BLK1	ND	ug/L	0.20	0.059	
PCB-1242	B089404-BLK1	ND	ug/L	0.20	0.037	
PCB-1248	B089404-BLK1	ND	ug/L	0.20	0.044	
PCB-1254	B089404-BLK1	ND	ug/L	0.20	0.037	
PCB-1260	B089404-BLK1	ND	ug/L	0.20	0.089	
Total PCB's (Summation)	B089404-BLK1	ND	ug/L	0.20	0.10	
TCMX (Surrogate)	B089404-BLK1	73.8	%	60 - 130 (LCL - UCL)		
Decachlorobiphenyl (Surrogate)	B089404-BLK1	79.5	%	60 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B089404										
Aldrin	B089404-BS1	LCS	0.16619	0.15000	ug/L	111		60 - 130		
gamma-BHC (Lindane)	B089404-BS1	LCS	0.16878	0.15000	ug/L	113		60 - 130		
4,4'-DDT	B089404-BS1	LCS	0.17878	0.15000	ug/L	119		60 - 130		
Dieldrin	B089404-BS1	LCS	0.17648	0.15000	ug/L	118		60 - 130		
Endrin	B089404-BS1	LCS	0.18392	0.15000	ug/L	123		60 - 130		
Heptachlor	B089404-BS1	LCS	0.16713	0.15000	ug/L	111		60 - 130		
TCMX (Surrogate)	B089404-BS1	LCS	0.29799	0.30000	ug/L	99.3		60 - 130		
Decachlorobiphenyl (Surrogate)	B089404-BS1	LCS	0.70285	0.60000	ug/L	117		60 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organochlorine Pesticides and PCB's (EPA Method 508)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B089404		Used client sample: N									
Aldrin	MS	2026568-96	ND	0.15504	0.15000	ug/L		103		60 - 130	
	MSD	2026568-96	ND	0.15460	0.15000	ug/L	0.3	103	30	60 - 130	
gamma-BHC (Lindane)	MS	2026568-96	ND	0.16051	0.15000	ug/L		107		60 - 130	
	MSD	2026568-96	ND	0.16562	0.15000	ug/L	3.1	110	30	60 - 130	
4,4'-DDT	MS	2026568-96	ND	0.15614	0.15000	ug/L		104		60 - 130	
	MSD	2026568-96	ND	0.17316	0.15000	ug/L	10.3	115	30	60 - 130	
Dieldrin	MS	2026568-96	ND	0.16517	0.15000	ug/L		110		60 - 130	
	MSD	2026568-96	ND	0.17275	0.15000	ug/L	4.5	115	30	60 - 130	
Endrin	MS	2026568-96	ND	0.15429	0.15000	ug/L		103		60 - 130	
	MSD	2026568-96	ND	0.16884	0.15000	ug/L	9.0	113	30	60 - 130	
Heptachlor	MS	2026568-96	ND	0.15644	0.15000	ug/L		104		60 - 130	
	MSD	2026568-96	ND	0.16410	0.15000	ug/L	4.8	109	30	60 - 130	
TCMX (Surrogate)	MS	2026568-96	ND	0.27596	0.30000	ug/L		92.0		60 - 130	
	MSD	2026568-96	ND	0.28807	0.30000	ug/L	4.3	96.0		60 - 130	
Decachlorobiphenyl (Surrogate)	MS	2026568-96	ND	0.60919	0.60000	ug/L		102		60 - 130	
	MSD	2026568-96	ND	0.64215	0.60000	ug/L	5.3	107		60 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis (EPA Method 515.1)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B089375						
Bentazon	B089375-BLK1	ND	ug/L	0.80	0.22	
2,4-D	B089375-BLK1	ND	ug/L	0.40	0.18	
2,4-DB	B089375-BLK1	ND	ug/L	3.0	0.37	
Dalapon	B089375-BLK1	ND	ug/L	5.0	0.31	
Dicamba	B089375-BLK1	ND	ug/L	0.080	0.040	
Dichloroprop	B089375-BLK1	ND	ug/L	0.50	0.11	
Dinoseb	B089375-BLK1	ND	ug/L	0.20	0.057	
MCPA	B089375-BLK1	ND	ug/L	10	6.0	
MCPP	B089375-BLK1	ND	ug/L	10	6.0	
2,4,5-T	B089375-BLK1	ND	ug/L	0.090	0.012	
2,4,5-TP (Silvex)	B089375-BLK1	ND	ug/L	0.070	0.032	
2,4-Dichlorophenylacetic acid (Surrogate)	B089375-BLK1	99.2	%	40 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis (EPA Method 515.1)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B089375										
2,4-D	B089375-BS1	LCS	2.4700	2.4000	ug/L	103		50 - 120		
2,4-DB	B089375-BS1	LCS	5.6300	5.4000	ug/L	104		50 - 120		
Dicamba	B089375-BS1	LCS	0.48000	0.60000	ug/L	80.0		50 - 120		
Dichloroprop	B089375-BS1	LCS	2.2100	2.4000	ug/L	92.1		50 - 120		
Dinoseb	B089375-BS1	LCS	1.0600	1.2000	ug/L	88.3		50 - 120		
2,4,5-T	B089375-BS1	LCS	0.64000	0.60000	ug/L	107		40 - 120		
2,4,5-TP (Silvex)	B089375-BS1	LCS	0.54000	0.60000	ug/L	90.0		50 - 120		
2,4-Dichlorophenylacetic acid (Surrogate)	B089375-BS1	LCS	3.1500	4.0000	ug/L	78.8		40 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis (EPA Method 515.1)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B089375		Used client sample: N									
2,4-D	MS	2026568-82	ND	2.5600	2.4000	ug/L		107		40 - 120	
	MSD	2026568-82	ND	3.1000	2.4000	ug/L	19.1	129	30	40 - 120	Q03
2,4-DB	MS	2026568-82	ND	6.0500	5.4000	ug/L		112		50 - 120	
	MSD	2026568-82	ND	7.3900	5.4000	ug/L	19.9	137	30	50 - 120	Q03
Dicamba	MS	2026568-82	ND	0.53000	0.60000	ug/L		88.3		50 - 120	
	MSD	2026568-82	ND	0.62000	0.60000	ug/L	15.7	103	30	50 - 120	
Dichloroprop	MS	2026568-82	ND	2.3100	2.4000	ug/L		96.2		40 - 120	
	MSD	2026568-82	ND	2.7800	2.4000	ug/L	18.5	116	30	40 - 120	
Dinoseb	MS	2026568-82	ND	1.1700	1.2000	ug/L		97.5		40 - 130	
	MSD	2026568-82	ND	1.3600	1.2000	ug/L	15.0	113	30	40 - 130	
2,4,5-T	MS	2026568-82	ND	0.66000	0.60000	ug/L		110		40 - 120	
	MSD	2026568-82	ND	0.79000	0.60000	ug/L	17.9	132	30	40 - 120	Q03
2,4,5-TP (Silvex)	MS	2026568-82	ND	0.58000	0.60000	ug/L		96.7		40 - 120	
	MSD	2026568-82	ND	0.69000	0.60000	ug/L	17.3	115	30	40 - 120	
2,4-Dichlorophenylacetic acid (Surrogate	MS	2026568-82	ND	3.4300	4.0000	ug/L		85.8		40 - 120	
	MSD	2026568-82	ND	4.0500	4.0000	ug/L	16.6	101		40 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B088874						
Benzene	B088874-BLK1	ND	ug/L	0.50	0.11	
Bromobenzene	B088874-BLK1	ND	ug/L	0.50	0.15	
Bromochloromethane	B088874-BLK1	ND	ug/L	0.50	0.27	
Bromodichloromethane	B088874-BLK1	ND	ug/L	0.50	0.20	
Bromoform	B088874-BLK1	ND	ug/L	0.50	0.46	
Bromomethane	B088874-BLK1	ND	ug/L	0.50	0.20	
n-Butylbenzene	B088874-BLK1	ND	ug/L	0.50	0.15	
sec-Butylbenzene	B088874-BLK1	ND	ug/L	0.50	0.13	
tert-Butylbenzene	B088874-BLK1	ND	ug/L	0.50	0.18	
Carbon tetrachloride	B088874-BLK1	ND	ug/L	0.50	0.17	
Chlorobenzene	B088874-BLK1	ND	ug/L	0.50	0.14	
Chloroethane	B088874-BLK1	ND	ug/L	0.50	0.17	
Chloroform	B088874-BLK1	ND	ug/L	0.50	0.14	
Chloromethane	B088874-BLK1	ND	ug/L	0.50	0.11	
2-Chlorotoluene	B088874-BLK1	ND	ug/L	0.50	0.14	
4-Chlorotoluene	B088874-BLK1	ND	ug/L	0.50	0.093	
Dibromochloromethane	B088874-BLK1	ND	ug/L	0.50	0.22	
1,2-Dibromo-3-chloropropane	B088874-BLK1	ND	ug/L	1.0	0.89	
1,2-Dibromoethane	B088874-BLK1	ND	ug/L	0.50	0.22	
Dibromomethane	B088874-BLK1	ND	ug/L	0.50	0.23	
1,2-Dichlorobenzene	B088874-BLK1	ND	ug/L	0.50	0.21	
1,3-Dichlorobenzene	B088874-BLK1	ND	ug/L	0.50	0.16	
1,4-Dichlorobenzene	B088874-BLK1	ND	ug/L	0.50	0.15	
Dichlorodifluoromethane	B088874-BLK1	ND	ug/L	0.50	0.15	
1,1-Dichloroethane	B088874-BLK1	ND	ug/L	0.50	0.15	
1,2-Dichloroethane	B088874-BLK1	ND	ug/L	0.50	0.17	
1,1-Dichloroethene	B088874-BLK1	ND	ug/L	0.50	0.27	
cis-1,2-Dichloroethene	B088874-BLK1	ND	ug/L	0.50	0.27	
trans-1,2-Dichloroethene	B088874-BLK1	ND	ug/L	0.50	0.17	
1,2-Dichloropropane	B088874-BLK1	ND	ug/L	0.50	0.15	
1,3-Dichloropropane	B088874-BLK1	ND	ug/L	0.50	0.13	
2,2-Dichloropropane	B088874-BLK1	ND	ug/L	0.50	0.18	
1,1-Dichloropropene	B088874-BLK1	ND	ug/L	0.50	0.19	
cis-1,3-Dichloropropene	B088874-BLK1	ND	ug/L	0.50	0.14	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B088874						
trans-1,3-Dichloropropene	B088874-BLK1	ND	ug/L	0.50	0.13	
Total 1,3-Dichloropropene	B088874-BLK1	ND	ug/L	0.50	0.27	
Ethylbenzene	B088874-BLK1	ND	ug/L	0.50	0.15	
Hexachlorobutadiene	B088874-BLK1	ND	ug/L	0.50	0.20	
Isopropylbenzene	B088874-BLK1	ND	ug/L	0.50	0.14	
p-Isopropyltoluene	B088874-BLK1	ND	ug/L	0.50	0.14	
Methylene chloride	B088874-BLK1	ND	ug/L	0.50	0.21	
Methyl t-butyl ether	B088874-BLK1	ND	ug/L	0.50	0.14	
Naphthalene	B088874-BLK1	ND	ug/L	0.50	0.16	
n-Propylbenzene	B088874-BLK1	ND	ug/L	0.50	0.12	
Styrene	B088874-BLK1	ND	ug/L	0.50	0.12	
1,1,1,2-Tetrachloroethane	B088874-BLK1	ND	ug/L	0.50	0.21	
1,1,2,2-Tetrachloroethane	B088874-BLK1	ND	ug/L	0.50	0.17	
Tetrachloroethene	B088874-BLK1	ND	ug/L	0.50	0.23	
Toluene	B088874-BLK1	ND	ug/L	0.50	0.17	
1,2,3-Trichlorobenzene	B088874-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trichlorobenzene	B088874-BLK1	ND	ug/L	0.50	0.15	
1,1,1-Trichloroethane	B088874-BLK1	ND	ug/L	0.50	0.21	
1,1,2-Trichloroethane	B088874-BLK1	ND	ug/L	0.50	0.21	
Trichloroethene	B088874-BLK1	ND	ug/L	0.50	0.19	
Trichlorofluoromethane	B088874-BLK1	ND	ug/L	0.50	0.14	
1,2,3-Trichloropropane	B088874-BLK1	ND	ug/L	1.0	0.78	
1,1,2-Trichloro-1,2,2-trifluoroethane	B088874-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trimethylbenzene	B088874-BLK1	ND	ug/L	0.50	0.17	
1,3,5-Trimethylbenzene	B088874-BLK1	ND	ug/L	0.50	0.14	
Vinyl chloride	B088874-BLK1	ND	ug/L	0.50	0.18	
Total Xylenes	B088874-BLK1	ND	ug/L	0.50	0.47	
Total Trihalomethanes	B088874-BLK1	ND	ug/L	2.0	0.97	
t-Amyl Methyl ether	B088874-BLK1	ND	ug/L	0.50	0.19	
t-Butyl alcohol	B088874-BLK1	ND	ug/L	10	9.4	
Diisopropyl ether	B088874-BLK1	ND	ug/L	0.50	0.36	
Ethyl t-butyl ether	B088874-BLK1	ND	ug/L	0.50	0.32	
p- & m-Xylenes	B088874-BLK1	ND	ug/L	0.50	0.34	
o-Xylene	B088874-BLK1	ND	ug/L	0.50	0.13	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B088874						
1,2-Dichloroethane-d4 (Surrogate)	B088874-BLK1	99.6	%	75 - 125 (LCL - UCL)		
Toluene-d8 (Surrogate)	B088874-BLK1	100	%	80 - 120 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	B088874-BLK1	97.4	%	80 - 120 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B088874										
Benzene	B088874-BS1	LCS	23.180	25.000	ug/L	92.7		70 - 130		
Bromodichloromethane	B088874-BS1	LCS	25.310	25.000	ug/L	101		70 - 130		
Chlorobenzene	B088874-BS1	LCS	22.700	25.000	ug/L	90.8		70 - 130		
Chloroethane	B088874-BS1	LCS	23.120	25.000	ug/L	92.5		70 - 130		
1,4-Dichlorobenzene	B088874-BS1	LCS	23.150	25.000	ug/L	92.6		70 - 130		
1,1-Dichloroethane	B088874-BS1	LCS	22.890	25.000	ug/L	91.6		70 - 130		
1,1-Dichloroethene	B088874-BS1	LCS	24.130	25.000	ug/L	96.5		70 - 130		
Toluene	B088874-BS1	LCS	23.580	25.000	ug/L	94.3		70 - 130		
Trichloroethene	B088874-BS1	LCS	23.130	25.000	ug/L	92.5		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B088874-BS1	LCS	10.230	10.000	ug/L	102		75 - 125		
Toluene-d8 (Surrogate)	B088874-BS1	LCS	9.8700	10.000	ug/L	98.7		80 - 120		
4-Bromofluorobenzene (Surrogate)	B088874-BS1	LCS	10.200	10.000	ug/L	102		80 - 120		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B088874		Used client sample: N									
Benzene	MS	2028435-01	ND	23.110	25.000	ug/L		92.4		70 - 130	
	MSD	2028435-01	ND	22.410	25.000	ug/L	3.1	89.6	20	70 - 130	
Bromodichloromethane	MS	2028435-01	ND	25.260	25.000	ug/L		101		70 - 130	
	MSD	2028435-01	ND	24.890	25.000	ug/L	1.5	99.6	20	70 - 130	
Chlorobenzene	MS	2028435-01	ND	22.810	25.000	ug/L		91.2		70 - 130	
	MSD	2028435-01	ND	21.930	25.000	ug/L	3.9	87.7	20	70 - 130	
Chloroethane	MS	2028435-01	ND	22.730	25.000	ug/L		90.9		70 - 130	
	MSD	2028435-01	ND	22.780	25.000	ug/L	0.2	91.1	20	70 - 130	
1,4-Dichlorobenzene	MS	2028435-01	ND	23.350	25.000	ug/L		93.4		70 - 130	
	MSD	2028435-01	ND	22.240	25.000	ug/L	4.9	89.0	20	70 - 130	
1,1-Dichloroethane	MS	2028435-01	ND	23.120	25.000	ug/L		92.5		70 - 130	
	MSD	2028435-01	ND	22.780	25.000	ug/L	1.5	91.1	20	70 - 130	
1,1-Dichloroethene	MS	2028435-01	ND	23.730	25.000	ug/L		94.9		70 - 130	
	MSD	2028435-01	ND	23.130	25.000	ug/L	2.6	92.5	20	70 - 130	
Toluene	MS	2028435-01	ND	24.140	25.000	ug/L		96.6		70 - 130	
	MSD	2028435-01	ND	23.610	25.000	ug/L	2.2	94.4	20	70 - 130	
Trichloroethene	MS	2028435-01	ND	23.890	25.000	ug/L		95.6		70 - 130	
	MSD	2028435-01	ND	22.860	25.000	ug/L	4.4	91.4	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	2028435-01	ND	9.7900	10.000	ug/L		97.9		75 - 125	
	MSD	2028435-01	ND	9.7000	10.000	ug/L	0.9	97.0		75 - 125	
Toluene-d8 (Surrogate)	MS	2028435-01	ND	9.9900	10.000	ug/L		99.9		80 - 120	
	MSD	2028435-01	ND	9.9700	10.000	ug/L	0.2	99.7		80 - 120	
4-Bromofluorobenzene (Surrogate)	MS	2028435-01	ND	10.050	10.000	ug/L		100		80 - 120	
	MSD	2028435-01	ND	9.8600	10.000	ug/L	1.9	98.6		80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B089066						
Acenaphthylene	B089066-BLK1	ND	ug/L	0.10	0.031	
Alachlor	B089066-BLK1	ND	ug/L	0.20	0.090	
Anthracene	B089066-BLK1	ND	ug/L	0.10	0.034	
Atraton	B089066-BLK1	ND	ug/L	0.50	0.057	
Atrazine	B089066-BLK1	ND	ug/L	0.30	0.14	
Benzo[a]anthracene	B089066-BLK1	ND	ug/L	0.20	0.044	
Benzo[b]fluoranthene	B089066-BLK1	ND	ug/L	0.30	0.034	
Benzo[k]fluoranthene	B089066-BLK1	ND	ug/L	0.30	0.072	
Benzo[a]pyrene	B089066-BLK1	ND	ug/L	0.10	0.050	
Benzo[g,h,i]perylene	B089066-BLK1	ND	ug/L	0.30	0.065	
Benzyl butyl phthalate	B089066-BLK1	ND	ug/L	4.0	0.047	
delta-BHC	B089066-BLK1	ND	ug/L	0.20	0.048	
gamma-BHC (Lindane)	B089066-BLK1	ND	ug/L	0.20	0.063	
bis(2-Ethylhexyl)phthalate	B089066-BLK1	ND	ug/L	3.0	0.030	
Bromacil	B089066-BLK1	ND	ug/L	0.50	0.043	
Chrysene	B089066-BLK1	ND	ug/L	0.30	0.060	
Diazinon	B089066-BLK1	ND	ug/L	0.20	0.080	
Dibenzo[a,h]anthracene	B089066-BLK1	ND	ug/L	0.30	0.051	
Di(2-ethylhexyl)adipate	B089066-BLK1	ND	ug/L	1.0	0.025	
Dimethoate	B089066-BLK1	ND	ug/L	2.0	0.050	
Dimethyl phthalate	B089066-BLK1	ND	ug/L	1.0	0.034	
Di-n-butyl phthalate	B089066-BLK1	ND	ug/L	1.0	0.063	
Fluorene	B089066-BLK1	ND	ug/L	0.20	0.029	
Hexachlorobenzene	B089066-BLK1	ND	ug/L	0.20	0.029	
Hexachlorocyclopentadiene	B089066-BLK1	ND	ug/L	1.0	0.12	
Indeno[1,2,3-cd]pyrene	B089066-BLK1	ND	ug/L	0.30	0.032	
Methoxychlor	B089066-BLK1	ND	ug/L	0.30	0.034	
Metolachlor	B089066-BLK1	ND	ug/L	0.50	0.056	
Metribuzin	B089066-BLK1	ND	ug/L	0.50	0.048	
Molinate	B089066-BLK1	ND	ug/L	0.50	0.036	
Phenanthrene	B089066-BLK1	ND	ug/L	0.10	0.020	
Prometon	B089066-BLK1	ND	ug/L	0.50	0.11	
Prometryn	B089066-BLK1	ND	ug/L	0.50	0.045	
Pyrene	B089066-BLK1	ND	ug/L	0.10	0.040	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B089066						
Secbumeton	B089066-BLK1	ND	ug/L	0.50	0.079	
Simazine	B089066-BLK1	ND	ug/L	0.30	0.066	
Terbutryn	B089066-BLK1	ND	ug/L	0.50	0.050	
Thiobencarb	B089066-BLK1	ND	ug/L	0.50	0.044	
Perylene-d12 (Surrogate)	B089066-BLK1	53.0	%	60 - 140 (LCL - UCL)		S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	B089066-BLK1	104	%	70 - 130 (LCL - UCL)		
Triphenylphosphate (Surrogate)	B089066-BLK1	116	%	70 - 130 (LCL - UCL)		
Pyrene-d10 (Surrogate)	B089066-BLK1	78.8	%	70 - 130 (LCL - UCL)		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B089066										
Acenaphthylene	B089066-BS1	LCS	0.51000	2.0000	ug/L	25.5		60 - 120		L01
Alachlor	B089066-BS1	LCS	2.1800	2.0000	ug/L	109		60 - 120		
Atrazine	B089066-BS1	LCS	2.5000	2.0000	ug/L	125		60 - 120		L01
Benzo[a]pyrene	B089066-BS1	LCS	0.91000	2.0000	ug/L	45.5		60 - 120		L01
Chrysene	B089066-BS1	LCS	2.7100	2.0000	ug/L	136		60 - 120		L01
Pyrene	B089066-BS1	LCS	1.6800	2.0000	ug/L	84.0		60 - 120		
Simazine	B089066-BS1	LCS	1.2100	2.0000	ug/L	60.5		60 - 120		
Perylene-d12 (Surrogate)	B089066-BS1	LCS	2.8800	5.0000	ug/L	57.6		60 - 140		S09
1,3-Dimethyl-2-nitrobenzene (Surrogate)	B089066-BS1	LCS	5.1900	5.0000	ug/L	104		70 - 130		
Triphenylphosphate (Surrogate)	B089066-BS1	LCS	4.8300	5.0000	ug/L	96.6		70 - 130		
Pyrene-d10 (Surrogate)	B089066-BS1	LCS	4.0900	5.0000	ug/L	81.8		70 - 130		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Organic Analysis by Liquid Solids Extraction (EPA Method 525.2)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B089066		Used client sample: N									
Acenaphthylene	MS	2026568-53	ND	0.62000	2.0000	ug/L		31.0		50 - 120	Q03
	MSD	2026568-53	ND	0.45000	2.0000	ug/L	31.8	22.5	30	50 - 120	Q02,Q03
Alachlor	MS	2026568-53	ND	2.2800	2.0000	ug/L		114		50 - 120	
	MSD	2026568-53	ND	2.0100	2.0000	ug/L	12.6	100	30	50 - 120	
Atrazine	MS	2026568-53	ND	2.5200	2.0000	ug/L		126		50 - 120	Q03
	MSD	2026568-53	ND	2.3500	2.0000	ug/L	7.0	118	30	50 - 120	
Benzo[a]pyrene	MS	2026568-53	ND	0.68000	2.0000	ug/L		34.0		50 - 120	Q03
	MSD	2026568-53	ND	0.87000	2.0000	ug/L	24.5	43.5	30	50 - 120	Q03
Chrysene	MS	2026568-53	ND	2.3100	2.0000	ug/L		116		50 - 120	
	MSD	2026568-53	ND	1.9400	2.0000	ug/L	17.4	97.0	30	50 - 120	
Pyrene	MS	2026568-53	ND	1.6500	2.0000	ug/L		82.5		50 - 120	
	MSD	2026568-53	ND	1.6100	2.0000	ug/L	2.5	80.5	30	50 - 120	
Simazine	MS	2026568-53	ND	1.3500	2.0000	ug/L		67.5		50 - 120	
	MSD	2026568-53	ND	1.1100	2.0000	ug/L	19.5	55.5	30	50 - 120	
Perylene-d12 (Surrogate)	MS	2026568-53	ND	2.6000	5.0000	ug/L		52.0		60 - 140	S09
	MSD	2026568-53	ND	3.2600	5.0000	ug/L	22.5	65.2		60 - 140	
1,3-Dimethyl-2-nitrobenzene (Surrogate)	MS	2026568-53	ND	5.4900	5.0000	ug/L		110		70 - 130	
	MSD	2026568-53	ND	5.4100	5.0000	ug/L	1.5	108		70 - 130	
Triphenylphosphate (Surrogate)	MS	2026568-53	ND	5.0900	5.0000	ug/L		102		70 - 130	
	MSD	2026568-53	ND	4.7700	5.0000	ug/L	6.5	95.4		70 - 130	
Pyrene-d10 (Surrogate)	MS	2026568-53	ND	4.1900	5.0000	ug/L		83.8		70 - 130	
	MSD	2026568-53	ND	4.3000	5.0000	ug/L	2.6	86.0		70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

EPA Method 1664

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B089179						
Oil and Grease	B089179-BLK1	ND	mg/L	5.0	0.74	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

EPA Method 1664

Quality Control Report - Laboratory Control Sample

								Control Limits		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab Quals
Oil and Grease	QC Batch ID: B089179									
	B089179-BS1	LCS	38.750	37.000	mg/L	105		78 - 114		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

EPA Method 1664

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		
									RPD	Percent Recovery	Lab Quals
QC Batch ID: B089179		Used client sample: N									
Oil and Grease	DUP	2026568-86	ND	ND		mg/L				18	
	MS	2026568-86	ND	38.700	37.000	mg/L		105		78 - 114	
	MSD	2026568-86	ND	37.950	37.000	mg/L	2.0	103	18	78 - 114	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B^J0012						
Total Nitrogen	B^J0012-BLK1	ND	mg/L	0.30	0.10	
QC Batch ID: B088760						
Non-Volatile Organic Carbon	B088760-BLK1	ND	mg/L	1.0	0.30	
QC Batch ID: B088791						
Chloride	B088791-BLK1	0.21400	mg/L	0.50	0.13	J
Nitrate as N	B088791-BLK1	ND	mg/L	0.10	0.024	
Sulfate	B088791-BLK1	ND	mg/L	1.0	0.14	
QC Batch ID: B088830						
MBAS	B088830-BLK1	ND	mg/L	0.10	0.024	
QC Batch ID: B088940						
Total Suspended Solids (Glass Fiber)	B088940-BLK1	ND	mg/L	0.50	0.50	
QC Batch ID: B088957						
Nitrite as N	B088957-BLK1	ND	ug/L	50	10	
QC Batch ID: B088971						
Total Dissolved Solids @ 180 C	B088971-BLK1	ND	mg/L	6.7	3.3	
QC Batch ID: B090236						
Total Kjeldahl Nitrogen	B090236-BLK1	ND	mg/L	0.20	0.088	
QC Batch ID: B090237						
Total Phosphorus	B090237-BLK1	ND	mg/L	0.050	0.018	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	Quals
QC Batch ID: B088760										
Non-Volatile Organic Carbon	B088760-BS1	LCS	5.0370	5.0000	mg/L	101		85 - 115		
QC Batch ID: B088791										
Chloride	B088791-BS1	LCS	50.362	50.000	mg/L	101		90 - 110		
Nitrate as N	B088791-BS1	LCS	4.8810	5.0000	mg/L	97.6		90 - 110		
Sulfate	B088791-BS1	LCS	100.86	100.00	mg/L	101		90 - 110		
QC Batch ID: B088830										
MBAS	B088830-BS1	LCS	0.19280	0.20000	mg/L	96.4		85 - 115		
QC Batch ID: B088957										
Nitrite as N	B088957-BS1	LCS	492.99	500.00	ug/L	98.6		90 - 110		
QC Batch ID: B088971										
Total Dissolved Solids @ 180 C	B088971-BS1	LCS	590.00	586.00	mg/L	101		90 - 110		
QC Batch ID: B090236										
Total Kjeldahl Nitrogen	B090236-BS1	LCS	2.0409	2.0000	mg/L	102		90 - 110		
QC Batch ID: B090237										
Total Phosphorus	B090237-BS1	LCS	1.0284	1.0000	mg/L	103		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab
QC Batch ID: B088760		Used client sample: N									
Non-Volatile Organic Carbon	DUP	2028631-01	0.39400	0.38900		mg/L	1.3		10		J
	MS	2028631-01	0.39400	5.7126	5.0251	mg/L		106		80 - 120	
	MSD	2028631-01	0.39400	5.6935	5.0251	mg/L	0.3	105	10	80 - 120	
QC Batch ID: B088791		Used client sample: N									
Chloride	DUP	2028651-06	50.448	50.418		mg/L	0.1		10		
	MS	2028651-06	50.448	105.26	50.505	mg/L		109		80 - 120	
	MSD	2028651-06	50.448	105.48	50.505	mg/L	0.2	109	10	80 - 120	
Nitrate as N	DUP	2028651-06	0.45500	0.45700		mg/L	0.4		10		
	MS	2028651-06	0.45500	5.5040	5.0505	mg/L		100		80 - 120	
	MSD	2028651-06	0.45500	5.5010	5.0505	mg/L	0.1	99.9	10	80 - 120	
Sulfate	DUP	2028651-06	51.735	51.850		mg/L	0.2		10		
	MS	2028651-06	51.735	163.95	101.01	mg/L		111		80 - 120	
	MSD	2028651-06	51.735	164.02	101.01	mg/L	0.0	111	10	80 - 120	
QC Batch ID: B088830		Used client sample: Y - Description: Ivanhoe #11, 10/01/2020 10:50									
MBAS	DUP	2028653-01	ND	ND		mg/L			20		
	MS	2028653-01	ND	0.43820	0.40000	mg/L		110		80 - 120	
	MSD	2028653-01	ND	0.41480	0.40000	mg/L	5.5	104	20	80 - 120	
QC Batch ID: B088940		Used client sample: N									
Total Suspended Solids (Glass Fiber)	DUP	2028646-01	239.24	240.51		mg/L	0.5		10		
QC Batch ID: B088957		Used client sample: N									
Nitrite as N	DUP	2028625-01	ND	ND		ug/L			10		
	MS	2028625-01	ND	534.28	526.32	ug/L		102		90 - 110	
	MSD	2028625-01	ND	531.07	526.32	ug/L	0.6	101	10	90 - 110	
QC Batch ID: B088971		Used client sample: Y - Description: Ivanhoe #11, 10/01/2020 10:50									
Total Dissolved Solids @ 180 C	DUP	2028653-01	1480.0	1510.0		mg/L	2.0		10		
QC Batch ID: B090236		Used client sample: Y - Description: Ivanhoe #11, 10/01/2020 10:50									
Total Kjeldahl Nitrogen	DUP	2028653-01	0.56610	0.45290		mg/L	22.2		20		A02
	MS	2028653-01	0.56610	2.5689	2.0000	mg/L		100		90 - 110	
	MSD	2028653-01	0.56610	2.6564	2.0000	mg/L	3.3	105	20	90 - 110	
QC Batch ID: B090237		Used client sample: Y - Description: Ivanhoe #11, 10/01/2020 10:50									
Total Phosphorus	DUP	2028653-01	0.11870	0.12320		mg/L	3.7		20		
	MS	2028653-01	0.11870	1.1652	1.0000	mg/L		105		80 - 120	
	MSD	2028653-01	0.11870	1.1343	1.0000	mg/L	2.7	102	20	80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B089142						
Total Recoverable Mercury	B089142-BLK1	ND	ug/L	0.20	0.022	
QC Batch ID: B089329						
Total Recoverable Antimony	B089329-BLK1	ND	ug/L	2.0	0.11	
Total Recoverable Arsenic	B089329-BLK1	ND	ug/L	2.0	0.70	
Total Recoverable Barium	B089329-BLK1	0.27200	ug/L	1.0	0.21	J
Total Recoverable Beryllium	B089329-BLK1	ND	ug/L	1.0	0.14	
Total Recoverable Cadmium	B089329-BLK1	0.16500	ug/L	1.0	0.11	J
Total Recoverable Chromium	B089329-BLK1	0.63700	ug/L	3.0	0.50	J
Total Recoverable Cobalt	B089329-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Copper	B089329-BLK1	0.69300	ug/L	2.0	0.22	J
Total Recoverable Lead	B089329-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Molybdenum	B089329-BLK1	ND	ug/L	1.0	0.11	
Total Recoverable Nickel	B089329-BLK1	ND	ug/L	2.0	0.19	
Total Recoverable Selenium	B089329-BLK1	ND	ug/L	2.0	0.19	
Total Recoverable Silver	B089329-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Thallium	B089329-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Vanadium	B089329-BLK1	ND	ug/L	3.0	0.78	
Total Recoverable Zinc	B089329-BLK1	ND	ug/L	10	1.7	
QC Batch ID: B089436						
Total Recoverable Iron	B089436-BLK1	ND	ug/L	50	30	
Total Recoverable Manganese	B089436-BLK1	ND	ug/L	10	4.0	
QC Batch ID: B089534						
Total Recoverable Iron	B089534-BLK1	ND	ug/L	50	30	
Total Recoverable Manganese	B089534-BLK1	ND	ug/L	10	4.0	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
QC Batch ID: B089142										
Total Recoverable Mercury	B089142-BS1	LCS	1.0650	1.0000	ug/L	106		85 - 115		
QC Batch ID: B089329										
Total Recoverable Antimony	B089329-BS1	LCS	42.797	40.000	ug/L	107		85 - 115		
Total Recoverable Arsenic	B089329-BS1	LCS	108.14	100.00	ug/L	108		85 - 115		
Total Recoverable Barium	B089329-BS1	LCS	43.449	40.000	ug/L	109		85 - 115		
Total Recoverable Beryllium	B089329-BS1	LCS	42.689	40.000	ug/L	107		85 - 115		
Total Recoverable Cadmium	B089329-BS1	LCS	43.791	40.000	ug/L	109		85 - 115		
Total Recoverable Chromium	B089329-BS1	LCS	42.212	40.000	ug/L	106		85 - 115		
Total Recoverable Cobalt	B089329-BS1	LCS	42.915	40.000	ug/L	107		85 - 115		
Total Recoverable Copper	B089329-BS1	LCS	109.20	100.00	ug/L	109		85 - 115		
Total Recoverable Lead	B089329-BS1	LCS	110.53	100.00	ug/L	111		85 - 115		
Total Recoverable Molybdenum	B089329-BS1	LCS	40.126	40.000	ug/L	100		85 - 115		
Total Recoverable Nickel	B089329-BS1	LCS	110.04	100.00	ug/L	110		85 - 115		
Total Recoverable Selenium	B089329-BS1	LCS	111.71	100.00	ug/L	112		85 - 115		
Total Recoverable Silver	B089329-BS1	LCS	42.559	40.000	ug/L	106		85 - 115		
Total Recoverable Thallium	B089329-BS1	LCS	43.420	40.000	ug/L	109		85 - 115		
Total Recoverable Vanadium	B089329-BS1	LCS	40.600	40.000	ug/L	102		85 - 115		
Total Recoverable Zinc	B089329-BS1	LCS	113.41	100.00	ug/L	113		85 - 115		
QC Batch ID: B089436										
Total Recoverable Iron	B089436-BS1	LCS	947.75	1000.0	ug/L	94.8		85 - 115		
Total Recoverable Manganese	B089436-BS1	LCS	464.99	500.00	ug/L	93.0		85 - 115		
QC Batch ID: B089534										
Total Recoverable Iron	B089534-BS1	LCS	993.62	1000.0	ug/L	99.4		85 - 115		
Total Recoverable Manganese	B089534-BS1	LCS	498.30	500.00	ug/L	99.7		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab
QC Batch ID: B089142		Used client sample: N									
Total Recoverable Mercury	DUP	2028582-01	0.16500	0.14000		ug/L	16.4		20		J
	MS	2028582-01	0.16500	1.1325	1.0000	ug/L		96.8		70 - 130	
	MSD	2028582-01	0.16500	1.2025	1.0000	ug/L	6.0	104	20	70 - 130	
QC Batch ID: B089329		Used client sample: N									
Total Recoverable Antimony	DUP	2028588-03	0.28700	0.23500		ug/L	19.9		20		J
	MS	2028588-03	0.28700	44.450	40.000	ug/L		110		70 - 130	
	MSD	2028588-03	0.28700	42.308	40.000	ug/L	4.9	105	20	70 - 130	
Total Recoverable Arsenic	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	112.08	100.00	ug/L		112		70 - 130	
	MSD	2028588-03	ND	109.13	100.00	ug/L	2.7	109	20	70 - 130	
Total Recoverable Barium	DUP	2028588-03	63.778	62.500		ug/L	2.0		20		
	MS	2028588-03	63.778	102.40	40.000	ug/L		96.6		70 - 130	
	MSD	2028588-03	63.778	103.95	40.000	ug/L	1.5	100	20	70 - 130	
Total Recoverable Beryllium	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	42.310	40.000	ug/L		106		70 - 130	
	MSD	2028588-03	ND	41.985	40.000	ug/L	0.8	105	20	70 - 130	
Total Recoverable Cadmium	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	43.040	40.000	ug/L		108		70 - 130	
	MSD	2028588-03	ND	41.575	40.000	ug/L	3.5	104	20	70 - 130	
Total Recoverable Chromium	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	41.758	40.000	ug/L		104		70 - 130	
	MSD	2028588-03	ND	39.913	40.000	ug/L	4.5	99.8	20	70 - 130	
Total Recoverable Cobalt	DUP	2028588-03	1.2130	1.2080		ug/L	0.4		20		
	MS	2028588-03	1.2130	42.051	40.000	ug/L		102		70 - 130	
	MSD	2028588-03	1.2130	40.452	40.000	ug/L	3.9	98.1	20	70 - 130	
Total Recoverable Copper	DUP	2028588-03	94.688	92.841		ug/L	2.0		20		
	MS	2028588-03	94.688	196.24	100.00	ug/L		102		70 - 130	
	MSD	2028588-03	94.688	196.11	100.00	ug/L	0.1	101	20	70 - 130	
Total Recoverable Lead	DUP	2028588-03	0.28000	0.25400		ug/L	9.7		20		J
	MS	2028588-03	0.28000	108.75	100.00	ug/L		108		70 - 130	
	MSD	2028588-03	0.28000	104.62	100.00	ug/L	3.9	104	20	70 - 130	
Total Recoverable Molybdenum	DUP	2028588-03	4.2080	3.6800		ug/L	13.4		20		
	MS	2028588-03	4.2080	46.669	40.000	ug/L		106		70 - 130	
	MSD	2028588-03	4.2080	46.139	40.000	ug/L	1.1	105	20	70 - 130	
Total Recoverable Nickel	DUP	2028588-03	8.5090	8.7240		ug/L	2.5		20		
	MS	2028588-03	8.5090	109.72	100.00	ug/L		101		70 - 130	
	MSD	2028588-03	8.5090	105.87	100.00	ug/L	3.6	97.4	20	70 - 130	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Metals Analysis

Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab
QC Batch ID: B089329		Used client sample: N									
Total Recoverable Selenium	DUP	2028588-03	1.4800	0.96200		ug/L	42.4		20		J,A02
	MS	2028588-03	1.4800	113.00	100.00	ug/L		112		70 - 130	
	MSD	2028588-03	1.4800	113.79	100.00	ug/L	0.7	112	20	70 - 130	
Total Recoverable Silver	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	41.876	40.000	ug/L		105		70 - 130	
	MSD	2028588-03	ND	42.254	40.000	ug/L	0.9	106	20	70 - 130	
Total Recoverable Thallium	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	42.889	40.000	ug/L		107		70 - 130	
	MSD	2028588-03	ND	41.719	40.000	ug/L	2.8	104	20	70 - 130	
Total Recoverable Vanadium	DUP	2028588-03	ND	ND		ug/L			20		
	MS	2028588-03	ND	42.933	40.000	ug/L		107		70 - 130	
	MSD	2028588-03	ND	40.545	40.000	ug/L	5.7	101	20	70 - 130	
Total Recoverable Zinc	DUP	2028588-03	8.9130	7.9220		ug/L	11.8		20		J
	MS	2028588-03	8.9130	119.84	100.00	ug/L		111		70 - 130	
	MSD	2028588-03	8.9130	113.18	100.00	ug/L	5.7	104	20	70 - 130	
QC Batch ID: B089436		Used client sample: N									
Total Recoverable Iron	DUP	2029109-01	240.60	262.87		ug/L	8.8		20		
	MS	2029109-01	240.60	1243.8	1000.0	ug/L		100		75 - 125	
	MSD	2029109-01	240.60	1216.6	1000.0	ug/L	2.2	97.6	20	75 - 125	
Total Recoverable Manganese	DUP	2029109-01	5.1589	5.7498		ug/L	10.8		20		J
	MS	2029109-01	5.1589	499.02	500.00	ug/L		98.8		75 - 125	
	MSD	2029109-01	5.1589	500.03	500.00	ug/L	0.2	99.0	20	75 - 125	
QC Batch ID: B089534		Used client sample: Y - Description: Ivanhoe #8, 10/01/2020 10:00									
Total Recoverable Iron	DUP	2028653-03	ND	ND		ug/L			20		
	MS	2028653-03	ND	962.24	1000.0	ug/L		96.2		75 - 125	
	MSD	2028653-03	ND	1024.7	1000.0	ug/L	6.3	102	20	75 - 125	
Total Recoverable Manganese	DUP	2028653-03	136.47	140.08		ug/L	2.6		20		
	MS	2028653-03	136.47	621.61	500.00	ug/L		97.0		75 - 125	
	MSD	2028653-03	136.47	659.57	500.00	ug/L	5.9	105	20	75 - 125	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/21/2020 11:10
Project: Cottonwood Sand Mine Project
Project Number: S020.1016
Project Manager: Kyle Welchans

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A02	The difference between duplicate readings is less than the quantitation limit.
A07	Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
A19	Surrogate is high due to matrix interference. Interferences verified through second extraction/analysis.
L01	The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
Q02	Matrix spike precision is not within the control limits.
Q03	Matrix spike recovery(s) was(were) not within the control limits.
S09	The surrogate recovery for this compound was not within the control limits.
V11	The Continuing Calibration Verification (CCV) recovery was not within established control limits.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Date of Report: 10/13/2020

Kyle Welchans

Geologic Associates (Main)

11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Client Project: [none]
BCL Project: Cottonwood Sand Mine Project
BCL Work Order: 2028654
Invoice ID: B394569

Enclosed are the results of analyses for samples received by the laboratory on 10/1/2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Natalie Serda
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Table of Contents

Sample Information

Chain of Custody and Cooler Receipt form.....	3
Laboratory / Client Sample Cross Reference.....	6

Bacteriological Sample Results

2028654-01 - Ivanhoe #11	
Water Analysis (Bacteriological).....	7
2028654-02 - Lake #11	
Water Analysis (Bacteriological).....	8
2028654-03 - Ivanhoe #8	
Water Analysis (Bacteriological).....	9

Notes

Notes and Definitions.....	10
----------------------------	----



LABORATORIES, INC.

4100 Atlas Ct. - Bakersfield, CA 93308 - 661.327.4911 - Fax: 661.327.1918 - www.bclabs.com

Chain of Custody Form

Page 1 of 1

Report To: GEO-LOGIC ASSOCIATES Client: KYLE WELLMANS Street Address: 14415 W. BERNARDO CT City, State, Zip: SAN DIEGO CA 92127 Phone: 451-1136 Fax: _____ Email: _____		Project #: SO20.1016 Project Name: COTTONWOOD Sampler(s): N. REASON		Analysis Requested Please refer to the attached list for details.		Page 1 of 1 Comments: * 24 HOUR HOLD ON TOTAL COLIFORM AND E. COLI *	
Work Order #: 20-28653(20-28654)		Sample Matrix Soil _____ Sludge _____ Drinking Water _____ Ground Water _____ Waste Water _____ Other _____		Result Request **Surcharge ☒ STD ☐ 5 Day** ☐ 4 Day** (10 Days) ☐ 3 Day** ☐ 2 Day** ☐ 1 Day**			
Notes		Notes		Notes			
Sample #		Description		Date Sampled		Time Sampled	
1		IVANHOE #11 (-1)		10/1/20		1050	
2		LAKE #11 (-2)		10/1/20		1040	
3		IVANHOE #8 (-3)		10/1/20		1000	
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							

*For Drinking Water, mark "EDT - yes or no." If marked no, BCL will not upload at a future date.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2028654 Page 2 of 3

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 of 2							
Submission #: 20-28653(20-28654)											
SHIPPING INFORMATION			SHIPPING CONTAINER		FREE LIQUID						
Fed Ex ☐	UPS ☐	Ontrac ☐ Hand Delivery ☐	Ice Chest ☒	None ☐ Box ☐	YES ☐ NO ☐						
BC Lab Field Service ☒ Other ☐ (Specify) _____			Other ☐ (Specify) _____		W / S						
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: _____											
Custody Seals Ice Chest ☐ Containers ☐ None ☒ Comments: _____											
Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐											
All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐											
20C Received ☒ YES ☐ NO		Emissivity: 0.98 Container: PE Thermometer ID: 208		Date/Time 10/1 1747							
		Temperature: (A) 1.7 °C / (C) 1.5 °C		Analyst Init UP							
SAMPLE CONTAINERS		SAMPLE NUMBERS									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES		DE	DE	DE							
4oz / 8oz / 16oz PE UNPRES											
2oz Cr ⁴											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz		F	F								
PT CYANIDE											
PT NITROGEN FORMS		AP	G								
PT TOTAL SULFIDE											
2oz NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON			H								
PT CHEMICAL OXYGEN DEMAND											
P/A PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL		AB			AB	AB					
QT EPA 1664		I									
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL		(AB)	(AB)	(AB)							
40 ml VOA VIAL- 504											
QT EPA 508/608/8080											
QT EPA 515/18150											
QT EPA 52E		020	J								
QT EPA 525 TRAVEL BLANK											
40ml EPA 547		024	K								
40ml EPA 531.1											
3oz EPA 548		028	LM								
QT EPA 549											
QT EPA 8015M											
QT EPA 8270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOHL SLEEVE											
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments: -4A Q CAB, -5AB QCTB

Sample Numbering Completed By: UP

A = Actual / C = Corrected

Date/Time: 10/1 2013

Rev 21 05/23/2016

(S:\WPDec\Word\Perfec\LAB_DOC\FORMS\515\AN\REV 201)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 2028654 Page 3 of 3

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page <u>2</u> of <u>2</u>	
Submission #: <u>20-28653(20-28654)</u>					
SHIPPING INFORMATION			SHIPPING CONTAINER		FREE LIQUID
Fed Ex ☐	UPS ☐	Ontrac ☐ Hand Delivery ☐	Ice Chest ☒	None ☐ Box ☐	YES ☐ NO ☐
BC Lab Field Service ☒ Other ☐ (Specify) _____			Other ☐ (Specify) _____		W / S
Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments: _____					
Custody Seals: Ice Chest ☐ Containers ☐ None ☒ Comments: _____					
Intact? Yes ☐ No ☐ Intact? Yes ☐ No ☐					
All samples received? Yes ☐ No ☐ All samples containers intact? Yes ☐ No ☐ Description(s) match COC? Yes ☐ No ☐					
COC Received		Emissivity: <u>0.98</u>	Container: <u>PE</u>	Thermometer ID: <u>208</u>	Date/Time: <u>9/10/17</u>
☒ YES ☐ NO		Temperature: (A) <u>1.4</u> °C / (C) <u>1.2</u> °C		Analyst Init: <u>1/1</u>	

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr ⁶⁺										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz			F							
PT CYANIDE										
PT NITROGEN FORMS	G		G							
PT TOTAL SULFIDE										
2oz NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON	H		H							
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	APL		APL							
QT EPA 1661	I		I							
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL - 504										
QT EPA 5050B/5050										
QT EPA 515.1/5150										
QT EPA 525	020	JKK								
QT EPA 525 TRAVEL BLANK		GR								
40ml EPA 507	024	ML	J							
40ml EPA 531.1										
8oz EPA 544	028	NR								
QT EPA 549	028	MN	KL							
QT EPA 501SM										
QT EPA 5270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMARTKIT										
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: VP

Date/Time: 10/2 1756

Rev 21

A = Actual / C = Corrected

(S:\WTDecWoodPac\Lab_DOC\FORMS\

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/13/2020 11:28
Project: Cottonwood Sand Mine Project
Project Number: [none]
Project Manager: Kyle Welchans

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
2028654-01	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 10:50
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Ivanhoe #11	Lab Matrix:	Water
	Sampled By:	N. Reason	Sample Type:	Groundwater
2028654-02	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 10:40
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Lake #11	Lab Matrix:	Water
	Sampled By:	N. Reason	Sample Type:	Groundwater
2028654-03	COC Number:	---	Receive Date:	10/01/2020 17:47
	Project Number:	---	Sampling Date:	10/01/2020 10:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Ivanhoe #8	Lab Matrix:	Water
	Sampled By:	N. Reason	Sample Type:	Groundwater

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/13/2020 11:28
Project: Cottonwood Sand Mine Project
Project Number: [none]
Project Manager: Kyle Welchans

2028654-01

Water Analysis (Bacteriological)

COC Number:	---	District ID:	
Project Number:	---	System Number:	
Sampling Location:	---	Station Number:	
Sampling Point:	Ivanhoe #11	Sample Site:	
Sampled By:	N. Reason	Residual Chlorine, ppm:	
Receive Date:	10/01/2020 17:47	Temperature, C:	
Sampling Date:	10/01/2020 10:50		
Sample Depth:	---		
Sample Matrix:	Water		

Colilert (Quantitray)

Constituent	Result	Units	Method	Analyst	Initial Dilution	Date Started	Date Completed	Lab Quals
Total Coliform, Confirmed Test	46	Positive Wells	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
Total Coliform, Density	88	MPN/100ml	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
E. Coli, Confirmed Test	0	Positive Wells	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
E. Coli, Density	<1	MPN/100ml	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/13/2020 11:28
Project: Cottonwood Sand Mine Project
Project Number: [none]
Project Manager: Kyle Welchans

2028654-02

Water Analysis (Bacteriological)

COC Number:	---	District ID:	
Project Number:	---	System Number:	
Sampling Location:	---	Station Number:	
Sampling Point:	Lake #11	Sample Site:	
Sampled By:	N. Reason	Residual Chlorine, ppm:	
Receive Date:	10/01/2020 17:47	Temperature, C:	
Sampling Date:	10/01/2020 10:40		
Sample Depth:	---		
Sample Matrix:	Water		

Colilert (Quantitray)

Constituent	Result	Units	Method	Analyst	Initial Dilution	Date Started	Date Completed	Lab Quals
Total Coliform, Confirmed Test	97	Positive Wells	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
Total Coliform, Density	>2400	MPN/100ml	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
E. Coli, Confirmed Test	0	Positive Wells	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
E. Coli, Density	<1	MPN/100ml	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/13/2020 11:28
Project: Cottonwood Sand Mine Project
Project Number: [none]
Project Manager: Kyle Welchans

2028654-03

Water Analysis (Bacteriological)

COC Number:	---	District ID:	
Project Number:	---	System Number:	
Sampling Location:	---	Station Number:	
Sampling Point:	Ivanhoe #8	Sample Site:	
Sampled By:	N. Reason	Residual Chlorine, ppm:	
Receive Date:	10/01/2020 17:47	Temperature, C:	
Sampling Date:	10/01/2020 10:00		
Sample Depth:	---		
Sample Matrix:	Water		

Colilert (Quantitray)

Constituent	Result	Units	Method	Analyst	Initial Dilution	Date Started	Date Completed	Lab Quals
Total Coliform, Confirmed Test	0	Positive Wells	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
Total Coliform, Density	<1	MPN/100ml	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
E. Coli, Confirmed Test	0	Positive Wells	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	
E. Coli, Density	<1	MPN/100ml	SM-9223B	JT1	1	10/02/2020 09:30	10/03/2020	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Laboratories, Inc.

Environmental Testing Laboratory Since 1949



Geologic Associates (Main)
11415 West Bernardo Court, Suite 200
San Diego, CA 92127

Reported: 10/13/2020 11:28
Project: Cottonwood Sand Mine Project
Project Number: [none]
Project Manager: Kyle Welchans

Notes And Definitions

MPN Most Probable Number

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.